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Tie Steel Business to Affairs of State

President of American Iron and Steel Institute and
British Ambassador Suggest Steps to
Reestablish Favorable Conditions

APART from technical contributions of wide scope and practical importance, the regular general meeting at the Hotel Commodore, New York, Friday, May 22, of the American Iron and Steel Institute tied the prosperity of the iron and steel business to politics in the larger sense. The address of Chairman Elbert H. Gary of the United States Steel Corporation as president of the institute did this at the opening of the all-day convention, as did a formal address by the British Ambassador to the United States at the banquet in the evening. The one naturally dwelt chiefly with economic and political affairs within the country and the other focussed on questions of international importance. The meeting was marked as usual by large attendance for both the opening session and the banquet, crowded anteroom informal conversations and a technical session before and after the luncheon. So far as space allows, the subjoined reviews will cover the high spots of the papers and of the discussions contributed to them, leaving for subsequent issues the further consideration of the meeting.

Diseases of Business

President Gary took as his subject "The Diseases of Business." Besides enumerating afflictions besetting industry, particularly iron and steel, he indulged in prognosis. For example, the season's crop outlook is exceedingly good. Also, "the present Administration is disposed to aid all the people alike in legitimately securing progress and prosperity. The President and members of his cabinet have publicly given expression in favor of reducing the unreasonable burdens created by taxation and otherwise." Indeed, continued Judge Gary, "never before within the memory of the members of this large audience has there been in these United States an administration which, in all respects, was better calculated to advance the best interests of the whole population."

He recounted also the cash resources of the country, "largest in our history and increasing"; exports

WHAT business is suffering from, says Judge Gary, are effects of war, bloc legislation, high taxes, high cost of living and ill-poised mental attitude of managers.

Its improvement lies in the good crop outlook, disposition of legislative as well as executive branches of the Government to aid business, the large cash resources of the country, good foreign trade and constantly multiplying uses of steel as a necessity.

Sir Esme Howard emphasizes that England must sell more goods abroad or stop buying, that unless confidence is restored throughout Europe and "we can work on the principle of goods across the sea," a worse cataclysm is likely than that produced by the actual state of war.

greater than ever before in proportion to imports, "foreign trade balances in the future without reasonable doubt will increase from year to year"; steel not as a luxury, but with uses constantly multiplying.

Among the unfavorable features of the iron and steel business, which, he asserted at the outset of his address, is not so good as it ought to be considering the underlying conditions of the country, were discussed the following:

The ill effects of the late stupendous World War as still in evidence throughout the universe.

Political conditions as typified by the attitude of some legislators inimical to the best interests of the people generally. "We do not intend to be a bloc seeking personal advantage," said he; "we do not believe in minority blocs which seek to dominate the affairs of the majority."

Taxes, which are much too high and have become almost chronic.

High costs of living. Prices are not, as a rule, proportionately increased in the larger units of business. "The large units generally, it is believed, are not receiving so much in net returns of business on the capital employed as before the war. Certainly this is the fact in the iron and steel industry, and in many others that could be mentioned."

What Afflicts Managers Themselves

Possibly the worst disease that afflicts the business structure of the United States, said President Gary, is the "abnormal, unnecessary, timid and ill-poised mental attitude of the managers themselves, including ourselves."

The attitude, conversations, substance and manner of statements concerning the present conditions and future prospects of business often materially affect its progress and success, he declared. It is just as proper to say: "We consider business is good; it is up to 75 per cent of producing capacity," as it is to say: "We consider business bad; it is down to 75 per cent of producing capacity." Whichever expression is used, the re-

sult is the same—6 or 7 per cent profit. "The net returns of business will not be different, but the psychological effect on those who hear me be quite different."

In concluding, Judge Gary said: "We shall see changes for the better. We shall find cures for some of the unnecessary evils. There will be better conditions, politically, financially, socially, morally. United political parties will take the place of divided antagonistic elements. The party placed in political control by the masses of the people will be supported in Congress and elsewhere in every reasonable effort to protect and advance the welfare of the Nation. Taxes will be reduced. Law and order will prevail. Industrial matters will be more equitably adjusted. The people more and more will recognize the great opportunities this country affords and conclude that to secure the best results for every one there should be domestic peace and harmony, a nation of united people considerate of the rights and obligations of all, increasing in power and influence and confident of the future."

Urge Greater Anglo-American Commerce

Sir Esme Howard, British Ambassador to the United States, emphasized that the United States and the British Empire are today each other's best customers, though the United States has the advantage in the visible trade balance. "United States exports to the British Empire represented in 1923 nearly 44 per cent of the whole exports, of which nearly one-half went to the United Kingdom. And it was only with the British Empire that the United States had a favorable trade balance of visible exports. It was indeed the great excess of United States exports to the British Empire that weighed the total balance so largely in favor of America.

"The United States exports to the United Kingdom in 1924 were, as always, made up mostly of raw materials, such as cotton, tobacco, mineral oils and wheat, all of which went, presumably, to help the inhabitants of the United Kingdom to manufacture goods for export to the United States again and to other countries. The total exports from the United States to the United Kingdom in 1924 represented a sum of over \$882,000,000, while the imports into United States from the United Kingdom amounted to only \$404,000,000, or less than half that sum.

"How is the balance paid for? That is the crux," continued the ambassador. "Before the war the balance used to be paid for by 'invisible exports'—interest on capital loaned, freight rates for shipping, etc., and no doubt also by profits made in trade with other countries. But today these invisible exports have shrunk and our foreign markets also have shrunk—in some cases as in Russia and Central Europe, shrunk almost to nothing—and we have to keep unemployed British subjects alive to the number of a million and a quarter, according to official statistics, and to over two million according to unofficial reports I have recently seen, not because they don't want to work, as some people imagine, but because if they did work we could not sell the goods they produced.

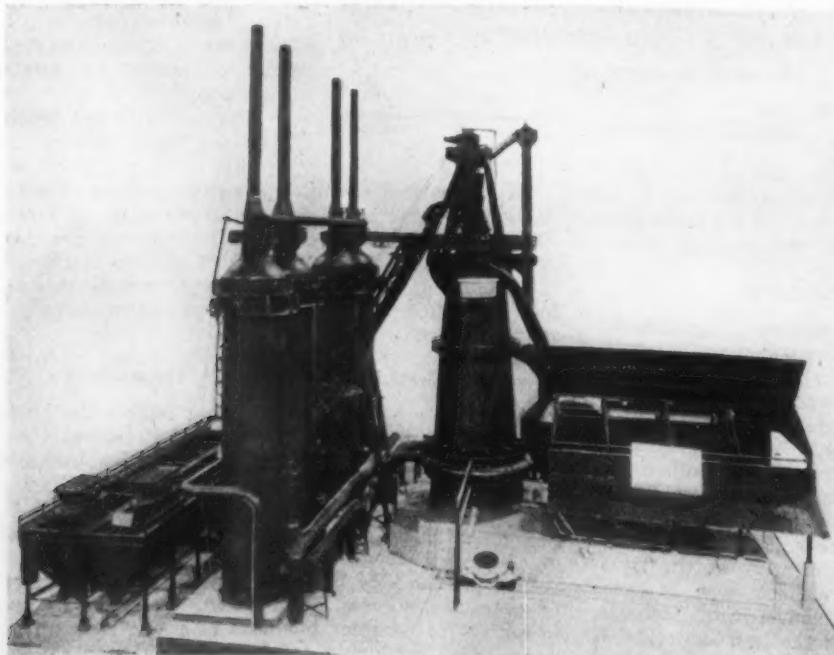
"Wherever we look the horizon is lowering. Our coal trade is very seriously depressed and numbers of small mines have been shut down. The shipbuilding industry is passing through a serious crisis owing to the absence of new orders. Conditions in the iron and steel industry are—especially as regards heavy iron and steel—very depressed and very discouraging. Out of a total of 102 blast furnaces in Scotland, of which 85 are normally in operation, only 21 are working at the present time.

Heading for Cataclysm Worse Than War

"The main and greatest factor on which we have to rely is the reestablishment of permanent peace in Europe and the increase of purchasing power in foreign markets. If Great Britain cannot sell her products abroad she cannot, of course, continue to buy raw materials and manufactured goods in the United States in the same heavy quantities as has been her custom. It is, I am sure, fully realized that Great Britain could scarcely carry on an unfavorable trade balance with the United States forever and yet pay the thirty-two odd million pounds per annum required to meet her indebtedness to the United States Government.

"We intend to meet our just debts but there may come a time when, unless the world situation changes for the better, unless we can return to something like pre-war conditions of credit and trade, it would be impossible both to make heavy purchases of raw materials from the United States and to pay the interest on our debt.

"I am not speaking now only for the United Kingdom nor for the British Empire but for the world at



MODEL of the
No. 1 Ensley
Blast Furnace of
the Tennessee Coal,
Iron & Railroad
Co., 1/32 of actual
size, shown at the
Southern Exposition
last week at the
Grand Central Pal-
ace, New York

large in declaring that as I see things, unless we can shortly restore a firm basis of confidence and credit throughout Europe and return to the natural flow of

trade, unless we can work on the principle of goods across the sea, we are heading for a worse cataclysm than that produced by the actual state of war."

Classification of Carbon Steel Billets

BY CHARLES O. HADLY



CCHARLES O. HADLY, general manager of sales for Alan Wood Iron & Steel Co., Philadelphia, has been connected with the steel business practically all his life. At the age of 15 he was employed in the office of W. Dewees Wood Co., Pittsburgh, and later entered the sales department of that company at McKeesport, Pa. In 1900 he became associated with the American Sheet Steel Co., Battery Park Building, New York, in charge of special finished sheets and other products. It was in 1907 that he became associated with the sales department of the Alan Wood Iron & Steel Co., assuming the position of assistant general manager of sales in 1911 and general manager of sales since 1918. He was a member of the sub-committee on sheets during the war and has been for the last eight years a member of the executive committee of the National Association of Sheet and Tin Plate Manufacturers. He is also a member of the Sheet Steel Trade Extension Committee.

THIS paper refers mainly to the carbon steels produced by the basic open-hearth process, which leads in point of tonnage, no reference being made to the so-called "Alloy" group, nor to electric furnace products, on which separate standards and classifications apply.

In the earlier years of steel production, billet classification soon appeared under two general classes, based simply on the process or method of working the billet, i.e., "rerolling" and "forging" (with provision for "axle" requirements).

The "rerolling," or base grade, contemplated ordinary rerolling uses, not over 0.25 per cent carbon or with range of "not exceeding 0.15 carbon." The billets were rolled into commodities on which there were the usual regular chemical ranges, and with the most simple, if any, physical tests. No one would have thought of specifying, for instance, carbon "0.08 or under" or low sulphur or phosphorus without special negotiations.

As needs developed for the higher carbon steels, differentials of from \$1 to \$5 were added to the rerolling base, for carbon ranging from 0.26 to 1.25 per cent or over, with others for manganese, sulphur, phosphorus, silicon, etc., when other than "standard." Rerolling billets were selling from \$16 to \$20 per ton, with common labor \$1.35 per day, freight rates approximately one-third of their present level, and additions such as ferromanganese, fluorspar, etc., available at comparatively low cost.

With some exceptions, these differentials, however, have not been concurrently adjusted in keeping with higher billet values. Meanwhile there has been an increasing tendency toward greater severity of buyers' specifications. What justification is there commercially for basing any special steel billet classifications today on the ordinary "rerolling" basis of a decade ago, which contemplated a "run of the mill" product, procurable at the lowest level of cost, and on a high yield tonnage basis without special selection or further cost items?

It is obvious that there have arisen legitimate uses for rolled products which were not contemplated under the old "rerolling" grade, such as billets for bars for tools in great variety, slabs for material which is pickled, cold rolled, and highly finished for deep drawing purposes, plated and polished.

Forging bars are a rolled product, but billets suitable for the purpose cannot be graded as "rerolling" on account of specified requirements and necessary results after forging, more particularly after drop forging.

These products are primarily "rolled" and in many cases the billet requirements can only be met by the equivalent of forging grade. Forging grade was provided for forging purposes, that is, to be shaped under the hammer rather than by rolling and usually machined. In forgings, too, the forgeman and the steel maker were faced with new demands developed by new and insistent uses.

Be it said to the credit of the industry that the steel maker threw himself into the task with splendid spirit, resorted to research and experiment, provided at great expense costly and improved equipment, and highly organized technical and operating departments; but while absorbed in these commendable activities, it may be truthfully said that some abuses and paradoxes, primarily due to "overlapping" classifications, crept into both the rerolling and forging grades and the important item of cost of production, under the increasingly severe and rigid specifications and inspection requirements of buyers, was either lost sight of by managers or cost accountants, or did not impress itself until cost sheets were verified by figures disclosed in red in the balance sheet. When such a business or commercial handicap exists, there is created an intolerable economic condition which calls for modification to whatever extent is reasonably necessary in order to avoid menacing the trade structure jointly reared by producer and consumer.

Assuming that "Rerolling" and "Forging" are the primary grades, billet classification would be based on:

Standard "Rerolling" billets, for rerolling where there are no further or special specifications.

Standard "Forging" billets, for forging where there are no further or special specifications.

When the specification or requirements exceed or transcend these grades, suitable and special classification should be based on:

- (1) The use or purpose.
- (2) Specification of requirements of the buyer.
- (3) Relation to cost of meeting the specified requirements.

The user of billets for rolled and forged articles, while keen and alive to all of the difficulties of main-

taining a uniform and high standard of quality at the lowest possible cost for his own finished product, does not fully appreciate that the same production anxieties and hazards exist in the plant of the steel maker who, to insure or guarantee the desired combinations, is forced to higher standards and costs.

A classification directly related to particular use would avoid discrimination and prevent hardship or economic loss to the steel manufacturer or consumer, as the case may be, and a detailed classification of finished products themselves points the way.

Classification of finished steel products follows more closely the lines of their specific use than does semi-finished steel, and a careful study of these classifications indicates that they are based on authentic and complete information. A similar method or procedure would assist in clarifying billet classification by establishing principles which would reasonably protect both producer and consumer under standardized classifications, so far as practicable.

There is no set formula, or convenient rule of thumb, by which commercial classification of billets can be secured along lines of good practice and sound policies by both maker and user without reasonable constructive cooperation.

Discussion

John F. Hazen, general manager of sales, Pittsburgh Steel Co., Pittsburgh, stated that the subject of Mr. Hadly's paper bears a vital relation to the industry as a whole. New responsibilities have been imposed upon the steel maker because of the developments in the use of steel for automobiles, tools, seamless tubes, etc. Commercial classifications of semi-finished steel are often out of harmony with technical standard specifications and out of line with actual mill conditions. A buyer of steel should give the seller a concise and clear statement of the use to which the steel is to be put. Any grade of steel not covered by the American Society for Testing Materials or the Association of American Steel Manufacturers should be classified by the consumer in some definite way when inquiring for prices. Cracks and scabs can be taken care of by the steel maker if the sales department knows what the consumer actually needs for a satisfactory product. The seller, however, should not accept the responsibility of injurious surface defects not consistent with good billet mill practice when the buyer attempts to substitute rerolling billets for forging billets.

Chemical analysis is not always the determining factor in manufacture, for, with similar accuracy of judgment, it is probable that two manufacturers working with different equipment would be compelled to employ different processes to obtain like perfection in the semi-finished product. For example, one maker might meet a requirement with top poured ingots, while another must pour bottom cast ingots and perhaps utilize other means to obtain the desired results. Practice as to the amount of discard may vary with individual ideas or products. The use of a greater or lesser portion of hot metal and the kind and amount of scrap in the open-hearth furnace may be a matter of choice, or actual need.

While some of these problems are of a segregated or local nature, others bear a distinct relation to the class of goods and should receive consideration. Equipment and methods have reached a high state of efficiency. Competition and perpetuation of industry demand continued research, economy and high standards of quality and service. Durability, rather than initial cost, is the ultimate test of value. Mr. Hadly's conclusion that special billet classification should contemplate usage or purpose and specification of buyer's requirements is worthy of the most favorable commendation.

"Special Purpose" Billets

W. W. Williams, general manager of sales, Pittsburgh Crucible Steel Co., Pittsburgh, said that one point remained to be briefly emphasized. Only a small

percentage of the tonnage of billets sold as commercial rerolling billets is properly described by that too-elastic term. This fact is generally recognized. In the past ten years many finishing mills, rolling bars mainly for structural purposes and using billets with no special quality requirements, have put in their own furnaces, including blooming and billet mills. This has naturally removed from the semi-finished market most of the material which Mr. Hadly has described as "run-of-the-mill product procurable at the lowest level of cost and on a high yield tonnage basis without special selection or further cost items." Most of the rest of the commercial billet tonnage is destined for special purposes, such as rerolling into cold strip steel, into billets for tools and even into automobile axles. Commercial rerolling billets, as originally and properly understood, are not uniformly satisfactory for those purposes. Since it is incumbent upon the steel manufacturer to furnish billets satisfactory for the purpose for which they are sold, the only solution is a classification of carbon steel billets that will recognize the special quality requirements of those users who consume a heavy tonnage of billets. Probably no fair-minded individual, or company, will object to a classification which is equitable, both from a manufacturing and market standpoint.

C. S. Bradley, general manager of sales, Jones & Laughlin Steel Corporation, Pittsburgh, characterizing Mr. Hadly's paper as a timely one, said that he believed that the point uppermost in the author's mind was that, in arriving at a standard classification for rerolling billets, advantage should be taken of the knowledge already gained in standardizing other commodities. Because rerolling billets originally contemplated only run-of-mill products, procurable at the lowest costs and on a high-yield tonnage basis, as Mr. Hadly states, "we cannot see any commercial justification for selling steel billets made to specifications at prices based on the run-of-mill rerolling classification of a decade ago. For instance, specifications for billets often call for restricted commercial limits, entire freedom from seams, of a quality guaranteed suitable for case-hardening, free cutting, etc. When a new development or improvement requires added expense in steel making, the users at first are generally willing to compensate the steel maker for the extra expense but after a time, when the practice becomes general, particularly in dull periods, pressure is brought to bear on sales organizations to accept the exactions without charges.

Specifications Adopted Last Year

In the case of hot-rolled bars, the distinction between commercial bar steel and special forging quality bar steel is now clearly defined in the two specifications adopted late last year by the Association of American Steel Manufacturers. This association, and the American Society for Testing Materials, have specifications for billets for forging purposes, but neither has framed companion specifications for rerolling billets. Mr. Hadly's proposal therefore is that consideration be given to the framing of specifications for rerolling billets in order that the existing situation may be terminated. This would be a comparatively simple matter. A specification, framed to meet the needs of the situation should provide: First, an easy system of nomenclature to facilitate correspondence and commercial transactions; second, a system whereby the needs of the user may be gauged, thereby enabling the steel maker to secure an adequate return for the precautions made necessary to meet the requirements; third, a system whereby the user may purchase billets with reasonable assurance that they will meet his requirements in the grade order. A specification such as suggested will enable the seller and purchaser to discuss their transactions by using the same terminology.

E. A. S. Clarke, secretary of the institute, and chairman of the afternoon session, closed the discussion on Mr. Hadly's paper with the remark that, in the average manufacturing business of today, about 80 per cent of the problems are those of merchandising and the remaining 20 per cent those of manufacturing.

He expressed it as his belief that the troubles between buyers and sellers, as to quality of billets in relation to requirements, come mostly from bad merchandising;

that is to say, they arise from failure to sell the customer the exact specification of steel which his requirements demand.

Blooming Mills and Practice

BY W. H. BAILEY



W. H. BAILEY, chief engineer Illinois Steel Co., was born in Allegheny Co., Pa., and obtained his early education in grammar and high school work in the Pittsburgh district. His first position was with the late Henry Aiken, consulting engineer, Pittsburgh. Following this he became connected with the engineering department of the Duquesne Steel Works of the Carnegie Steel Co., from 1900 to 1905. From 1905 to the spring of 1907 he was assistant to the chief engineer of the Donora Works of the Carnegie Steel Co. Following this, or from 1907 to 1910, he became chief draftsman for the Indiana Steel Co. in its Chicago office, and then chief engineer of the Gary Works of the Illinois Steel Co. from 1910 to 1916. In his present capacity he has been associated with the Illinois Steel Co. since 1916.

IN this paper, a most voluminous one, Mr. Bailey describes three outstanding types of blooming mills. "The most important is the two-high reversing bloomer, with its inherent possibilities of wide range of product and product sizes. Next in importance is the three-high non-reversing type, with a limited range of product and product sizes. Third is the multiple-stand tandem type, with but a single pass through each stand, having also a limited range of product sections and sizes. Because the tandem type and the three-high bloomer are usually special purpose mills, more time will be given to illustrating the two-high reversing type than to the others."

Mr. Bailey describes the manipulators and tables used in connection with these various types of mills and then furnishes a large amount of information on the practice obtained with various mills, including power consumption, draft reductions, metal displacement and various other features in the operation of the mills. There are 50 illustrations: 20 plans and elevations, 11 photographic views and 19 diagrams showing operating results.

As it will be impossible to provide space to cover these details this week, the paper has been deferred for use at a later time.

Discussion

F. C. Biggert, Jr., president United Engineering & Foundry Co., Pittsburgh, called attention particularly to the development of blooming mills during the past quarter-century. His first connection with this type of equipment was concerned with a 34-in. mill completed in 1902, and rolling ingots weighing about 7000 lb. each. He compared this mill with the 44-in. mill discussed in detail in the paper, in about the following manner, so far as weights are concerned:

Weights in pounds	1900 Mill	1925 Mill	Ratio
Mill proper	350,000	1,510,000	4.3
Mill table (both about same length)	265,000	1,065,000	4.0
Manipulators	45,000	1,150,000	25.5
Total these items	660,000	3,725,000	5.7
Roll-changing gear		204,000	

In discussing these figures, Mr. Biggert pointed out that the roll-changing gear is one of the devices of recent years, unknown at the earlier date, which speeds up the operation of the mill by cutting out lost time. The new manipulators are so far superior in facilities for handling steel that they cannot well be compared with the old ones.

It must not be considered that the 44-in. mill is long to remain an outstanding achievement. It may, before long, become practically standard size. Already a new mill is under construction, which will weigh just under 3,000,000 lb., or practically twice the 1,510,000 lb. of the 44-in. unit. The question arises: "Are we economically sound in this great increase in weight of equipment?" Cost is in about the same ratio as weight.

It is quite possible, by certain refinements in design, to make a mill which will weigh not more than 1,000,000 lb., and which can do substantially the work of the 44-in. mill described. This hypothetical mill at maximum output might roll only one-half as many tons per hour as the 44-in. mill, but it would cost only one-quarter as much, because the weight would be about one-quarter as much. Consequently the return on the money investment would be much greater. Furthermore, taking the situation year in and year out, with good times and bad times as they come along, it might well be that the lighter and less costly mill could roll as much steel in the average year as the heavy mill. "Both are equally efficient when both are shut down." Mr. Biggert was careful to explain that he was not criticising the 44-in. mill in any particular. He was questioning the advisability of increasing fixed charges so heavily as to handicap production costs.

Largest Single Armature Motor

O. Needham, general engineer Westinghouse Electric & Mfg. Co., pointed out that the 44-in. mill at Homestead, which was described in the paper, has the largest single-armature motor ever used to drive a rolling mill. This motor is of 7000 hp. Formerly for this size it had been universal practice to fit two 3500-hp. armatures on a single shaft, each with its own commutator projecting from its end of the motor frame, and both drawing current from the same main.

As the manipulator, in which the ingot spends 50 to 70 per cent of the overall time in its passage through the mill, is the place where most of the time is occupied, Mr. Needham recommended study of that device with the object of cutting down this time and thus increasing the percentage of the total time during which the ingot is between the rolls. This would result in greater production per hour for the mill and in a lowering of cost of rolling per ton.

Comparing two of the diagrams in the paper, based on steam-driven blooming mills, with a corresponding diagram based on electric drive, gives a good argu-

ment for the electric drive, said Mr. Needham. Excluding the last pass of the steam-driven mill, to bring conditions to about the same points as with the electric-driven mill, the steam consumption for the steam-driven mill works out at about 1700 lb. per ingot, against 442 lb. of steam for the electric drive. As the

ingots in the steam-driven mill were larger than those in the other mill, the further analysis shows 695 lb. of steam per ton of ingots in the steam-driven mill, against 268 lb. of steam per ton of ingots in the electrically driven mill. This ratio is 2.6 to 1 in favor of the electric drive.

American Steel Casting Industry

BY W. J. CORBETT



WILLIAM J. CORBETT, assistant director Electric Steel Founders Research Group, Chicago, has been actively identified with the steel foundry business during most of his career. After being graduated from the high school at Erie, Pa., he received the degree of Bachelor of Science in Mining Engineering from the Carnegie Institute of Technology, and later the degree of Metallurgical Engineer from the same school. In 1914, immediately on leaving college, he became a special apprentice in the Alliance and Chester plants of the American Steel Foundries. He was made production engineer at the latter plant at the close of his apprenticeship, and in 1917 received a commission in the United States Army, becoming Army Inspector of Ordnance at Buffalo. Later he was transferred to the Watertown Arsenal, Watertown, Mass., where he became assistant superintendent of the foundry. Following his discharge from the army he was appointed assistant to the fourth vice-president of the American Steel Foundries, Chicago. In 1921 he was made cost accountant of the Steel Founders' Society of America, and two years later became identified with the Electric Steel Founders' Research Group as industrial engineer. He was recently appointed secretary-manager of the Steel Founders' Society of America, with headquarters in Pittsburgh.

THE steel casting industry is divided into two general divisions namely, the manufacture of railroad castings, such as couplers, side-frames, bolsters, etc., for cars; and the manufacture of all other castings, generally classed as miscellaneous. The first-named is highly specialized, and its product is of a repetitive nature. The division devoted to the manufacture of miscellaneous castings is of the opposite nature, widely diversified both in size and design, thereby placing it in the class of industry doing a jobbing business.

Of the total number of people engaged in the steel casting industry, the larger portion is in the miscellaneous casting branch. Coincident with this fact, the total value of miscellaneous castings produced annually is normally greater than the total value of railroad specialties.

Steel-Making Equipment

Three types of melting furnaces are used in steel foundries; namely, open-hearth, electric and converter. The open-hearth furnace is the melting medium in steel foundries making miscellaneous castings of large and medium size, and in steel foundries designed solely for making railroad specialties. The basic-lined open-hearth furnace is used practically exclusively in the latter, while the acid-lined furnace is used in almost every foundry using the open-hearth process for miscellaneous castings. Steel can be made at a lower cost in open-hearth furnaces than in converters and electric furnaces.

The use of the electric arc furnace and the converter is generally restricted to the manufacture of small castings. This is their logical field, due to the ability to make very hot metal in smaller quantities than is practicable with the use of the open-hearth furnace. Small castings having sections as thin as 3/16 in. require very fluid steel to pour them. Although hot steel can be made in the open-hearth, it is usually impractical to attain the temperature possible in the other types of melting units, on account of the rapid deterioration of the walls and roof.

The electric furnace is to a great extent displacing the converter in the steel casting industry, as will be seen by reference to Table I, which is based on figures

Table I—Annual Production of Steel Castings by Different Melting Processes in Percentage of Total Production of all Processes

Year	Open-Hearth Furnace			Electric Furnace	Con-verter	Crucible
	Basic	Acid	Total			
1908.....	44.8	45.2	90.0	.00	5.94	2.39
1909.....	46.7	44.9	91.6	.05	5.16	2.28
1910.....	46.0	45.7	91.7	.14	6.20	1.56
1911.....	41.2	47.0	88.2	.29	8.81	2.17
1912.....	45.8	44.3	90.1	.43	7.11	2.12
1913.....	45.1	44.2	89.3	.90	7.89	1.72
1914.....	48.3	38.9	87.2	1.23	9.50	1.61
1915.....	38.4	46.4	84.8	2.66	10.66	1.70
1916.....	44.2	41.6	85.8	3.12	10.40	.68
1917.....	38.8	45.5	84.3	4.50	11.04	.27
1918.....	35.9	44.9	80.8	7.67	11.40	.09
1919.....	32.2	46.0	78.2	11.43	10.11	.10
1920.....	35.6	43.1	78.7	12.41	8.38	.14
1921.....	39.0	38.6	77.6	15.22	6.94	.13
1922.....	41.1	39.3	80.4	14.97	4.61	.11
1923.....	39.2	39.9	79.1	16.85	4.63	.13

compiled annually by the American Iron and Steel Institute. There are perhaps two reasons for this: One being that it is possible to regularly make better steel in the electric furnace; the other being that the steel can normally be made in many localities at a lower cost in the electric furnace than it can be made in the converter. The initial cost of an electric furnace installation is many times that of a converter and cupola. The melting loss in the converter is generally from 15 to 20 per cent of the scrap metal and pig iron used, whereas this loss is only about 5 per cent of the metal charged into the electric furnace. Of course, the local cost of electric power has an important influence on the actual difference in the cost of making steel for castings by the two processes.

[The author at this point discusses foundry prac-

tice, touching on the design of the casting, pattern equipment, use of chills, fillets, etc.]

Cost of Making Steel Castings

The cost summaries, prepared monthly or semi-monthly and used for controlling manufacturing operations in a steel foundry, are stated in terms of costs per ton of good castings, and they are usually very misleading. Such costs are simple arithmetical averages that give no consideration to the costs of individual castings, which have a great effect on the profitable conduct of the business. They represent the total average costs of making thousands of castings having different designs, each design having an individual cost of production differing from the others, and from the total cost used for the preparation of monthly financial statements. Fourteen cents per pound may be the average cost of making a large number of castings of different designs, some of which may range in cost from 8c. to 40c. per lb.

There are three main elements in the cost of making steel castings: Cost of steel, cost of labor, and indirect or overhead expense. These are not of equal significance; consequently, a fluctuation in the price status of one element produces an effect on the total production cost only commensurate with its relative importance. The cost of labor is the most important element entering into the total cost of making miscellaneous steel castings, and very much greater than it is in many other manufacturing industries.

The cost of the metal may vary from 10 to 45 per cent of the total average cost of operating a steel foundry. The percentage of the total cost of castings represented by the cost of steel depends on the designs of the castings. Hence, it is obvious that the weight of a casting, or in other words, the amount of steel in it, is not the governing factor in its total cost per pound. Even in the case of castings having the same weight but having different designs, the cost of steel alone may be different for each, due to the differences in their yields, meaning the percentages of the total amount of steel melted and poured into them that are represented by the amount of steel in the finished castings. The yield of good castings in percentage of the metal melted may vary from 30 to 80 per cent, depending on design.

The cost of labor and the indirect expense or overhead are more important factors in making steel castings than is the cost of the steel, and these elements of cost are not the same for all castings. They vary with the designs of the castings as well as with their weights. However, the latter are not so essential as the former, because the total cost per pound is not necessarily the same for castings having the same weights. A casting whose weight is 100 lb. may cost two or three times as much to make as another casting whose weight is the same, due to the difference in their designs which necessitate the expenditure of different amounts of labor and indirect expense in making them.

A significant item of expense, included in the main elements of cost mentioned previously, is that of defective castings, which includes those scrapped in the foundry and those found defective at the consumers' plants. The amount of expense attributed to this item is variable with the nature of the castings, although the total average amount of castings scrapped in the foundry may be from 5 to 15 per cent of all the castings produced. These approximate figures indicate the extent of the uncertainties and hazards which the steel foundryman must face, and which are often the cause of financial stress.

A general idea of the cost of making steel castings might be gained if a steel foundry is considered as a concern manufacturing different kinds of articles, each of which has a separate and distinct cost of production. If it is considered in this light, there would be no occasion for being confronted with the now common question, "What is the price of steel castings?" The price of this product necessarily is variable and depends on design.

Some producers and consumers of cast steel products consider them in terms of tonnage in the same way as steel ingots, rails, etc.; that is, a group of steel cast-

ings of miscellaneous designs is looked upon as a certain number of tons of steel. The fallacy of this is apparent when we analyze the making of steel castings, and find that they are manufactured articles requiring the expenditure of a large amount of labor, and that the cost of the steel in them is generally small compared with the cost of the labor performed on them.

Use of Steel Castings

The art of making steel castings has advanced rapidly. Years ago, many consumers encountered difficulties in obtaining satisfactory steel castings, and defects discovered in machine shops caused extra expense and delay in manufacture. These conditions led in some cases to the use of materials other than cast steel, and a greater cost in machining and assembling certain parts made of rolled or forged steel. This was expensive to consumers, due to the vast amount of labor expended in machining and assembling separate parts that could have been cast integrally. Due to the progress made in the manufacture of steel castings, much machine work on built-up parts to make them suitable for assembly can be reduced or eliminated by using steel castings that are in many cases of complex designs. Parts redesigned for cast steel can frequently be made lighter in weight without sacrificing strength, due to the ability to make cored recesses or pockets of various shapes in the castings.

Economy can be effected in some places by redesigning parts previously made of gray iron or malleable iron, in order that they can be made of cast steel, thereby securing greater strength with the added advantage of decreased weight.

Supply and Demand

The steel casting industry, like many others, has a producing capacity considerably in excess of the demand for its product, as will be seen by referring to Table II.

Table II—Orders for Steel Castings in Percentage of Producing Capacity

Year	Miscellaneous Castings	Railroad Specialty Castings
1915	73.9	66.3
1916	92.7	122.8
1917	96.7	67.7
1918	100.3	106.0
1919	46.3	25.4
1920	67.6	69.2
1921	24.8	25.0
1922	54.9	86.9
1923	72.8	77.0
1924	55.8	75.3

The figures in this table were compiled and distributed by the Department of Commerce which issues a bulletin showing the orders for steel castings booked each month. The significant feature of the data in the table is that in only one year in the last decade were the orders for miscellaneous steel castings equal in amount to the capacity of the foundries making this class of work. This was during the war in 1918, when there was an excessive demand for all kinds of manufactured products. Since the period of war-time inflation, the demand for steel castings has fallen far short of the steel foundry capacity in the United States. Even during the period of brisk business in 1923, it was only about 73 per cent of the capacity of that branch of the industry making miscellaneous castings.

The making of steel castings may appear to be reasonably free from complications, to those inexperienced in the business. It actually requires a high degree of skill, and involves many phases of engineering. A steel foundry, like any other business, is successful only when it is able to meet all its obligations as they mature, and to pay a reasonable return on sales and capital employed, with something more to provide for growth, replacements, improvements, and business depressions. To accomplish these things, an experienced and capable personnel is necessary, and the product must be sold with a knowledge of its manufacturing cost.

Discussion

F. A. Lorenz, assistant to the fourth vice-president, American Steel Foundries, Chicago, said that he believed that the many intricacies existing in the operation of the steel foundry were not generally appre-

ciated. For example, in the plants of his own company making miscellaneous steel castings, there are in use, on the average, over 30,000 patterns which are divided into thirty-nine separate classes. While Mr. Corbett's division of the industry into miscellaneous castings and railroad specialties is logical, his own company uses as a basis of classification metal thicknesses so far as possible.

In discussing electric and open-hearth steel and their relative merits, Mr. Lorenz said that progressive foundries are constantly improving open-hearth methods and making better open-hearth steel, that they are also actively engaged in laboratory investigations, in the perfection and study of heat treatment and other phases of the industry. In his opinion, there is very little difference between electric steel and properly-made acid open-hearth steel, which is the prevailing metal in foundries making miscellaneous steel castings.

It is almost a thing of the past to furnish a steel casting in the rough, many of them now being really

semi-finished. Taking car castings as an example, these are all carefully inspected and even gaged before shipment.

The railroads are effecting considerable savings by combining castings with forgings, structural parts, bolts, etc., to take the place of fabricated shapes. While this new development has involved some difficult problems, they are being overcome.

The number of different crafts employed in making steel castings is a feature of the industry. In the various plants of his own company Mr. Lorenz said that there are 100 different classes of workmen employed. While the molding and pouring of castings is one of the easy steps in the process, that of cleaning involves a great many more difficulties.

Progress is rapid from the engineering standpoint. Various ingenious schemes of production are being installed, such as sand handling machinery and other labor saving devices, which are having their effect in larger production per man, more uniformity in the casting and lower cost.

Steel Building Construction

BY LEE H. MILLER*

PHENOMENAL developments that accompanied the replacing of iron by steel started about 1885, when the Bessemer process began to make possible the commercial production of rolled steel in the form of shapes and plates of a grade and in tonnages suitable for use in buildings, bridges and other structures. Within less than a decade the completion of the transition was recognized by one of the leading steel mills, which announced in 1893 that all data relative to wrought iron was being eliminated from its handbook.

While considerable tonnages of steel were applied to the construction of railroad and city bridges, whose design and execution were generally under the supervision of experienced engineers, the notably new field that was to be developed with the aid of this new material was that of buildings proper, and especially tall tier buildings in large cities. Nobody was experienced in structures of this character. They had never been built before.

To assist in their proper design, the rolling mills employed bridge engineers who made special study of the manner in which structural steel might safely be adapted to the new requirements. Under their editorship the former mill catalogs were expanded into handbooks which supplemented the lists and properties of the sections rolled with simple information regarding their proper use, and which included formulas and tables to facilitate their safe application in all ordinary cases. The influence of the mill handbooks was far reaching. Building codes of many cities adopted their working stress of 16,000 lb. per sq. in. In many colleges these handbooks are still utilized as text books.

In addition to the assistance rendered by these mill publications, it should be noted that, while some building steel contracts were taken by bridge shops, and some by the more enterprising of the rapidly evolving architectural iron works, considerable tonnages of structural steel in fabricated form were furnished by the mills, which thus retained direct contact with the needs of the industry. Under this guidance, the use of fabricated structural steel in the United States grew from an estimated yearly consumption of 250,000 tons in 1892 to 1,563,000 tons in 1912.

It should be pointed out here that the figures of steel production published by the American Iron and Steel Institute under the heading Structural Shapes do not indicate the tonnages of fabricated structural steel consumed, nor are they an index to the amount of tier building steel work per year. The average steel frame tonnage for such buildings is distributed among shapes, plates and bars in percentages of about 65, 30 and 5, respectively. On the other hand, large tonnages of so-

called structural shapes are now being consumed in the manufacture of railroad cars and other non-building construction. For this reason the mills may report a maintenance of the tonnage of structural shapes produced, over a period during which the consumption thereof for structural building and bridge works shows a marked decline. This apparent contradiction of statistics has obtained since 1912.

For some years prior to 1912 the rolling mills had been gradually withdrawing from the field of fabricated material, and this field was becoming more and more the special domain of the shops. About this time new forms of structural shapes were being introduced by individual mills, and changes in unit stress and formulas were being increasingly advocated. In any event, the figures in Table I show that, for the three years 1911 to 1913, the mills produced an annual average of about 2,600,000 tons of structural shapes, while the average consumption of fabricated steel for the same period was 1,300,000 tons. For the three years 1919 to 1921 the mill production of structural shapes remained nearly the same, but the consumption of fabricated steel dropped to 900,000 tons, or only 69 per cent of its yearly average a decade previously.

In recent years there has been no uniformity as to the proper working stress on which designs should be based. It has been generally realized that the old 16,000-lb. basis, including as it did a generous "factor of ignorance," is now unnecessarily conservative. The steel is being made by better processes and with greater care, from furnace to finishing mill. Its chemistry and ductility are being improved. Its dimensional tolerances are more closely checked. Its inspection by both mill and customer is much more rigid. Its grade has become standardized under the specifications of the American Society for Testing Materials. It is a more reliable product. In addition, the art of applying the steel to its varied uses is no longer a new one.

The consequent increased confidence in both material and its application was naturally reflected in the use of higher unit stresses. Already 17,000 lb. had become the usual basis in metric countries, and 17,900 lb. in Great Britain. The old 16,000-lb. basis still governs the design of structures in certain American cities whose building codes had become crystallized, but elsewhere, and for practically all large bridges, higher stresses are being employed. There has been, however, no standard of conformity as to the precise value to be adopted.

One of the most troublesome features has been the appalling variety of column formulas in vogue. To point out the incongruity of these formulas, an 8 by

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Combination Lathe and Grinder

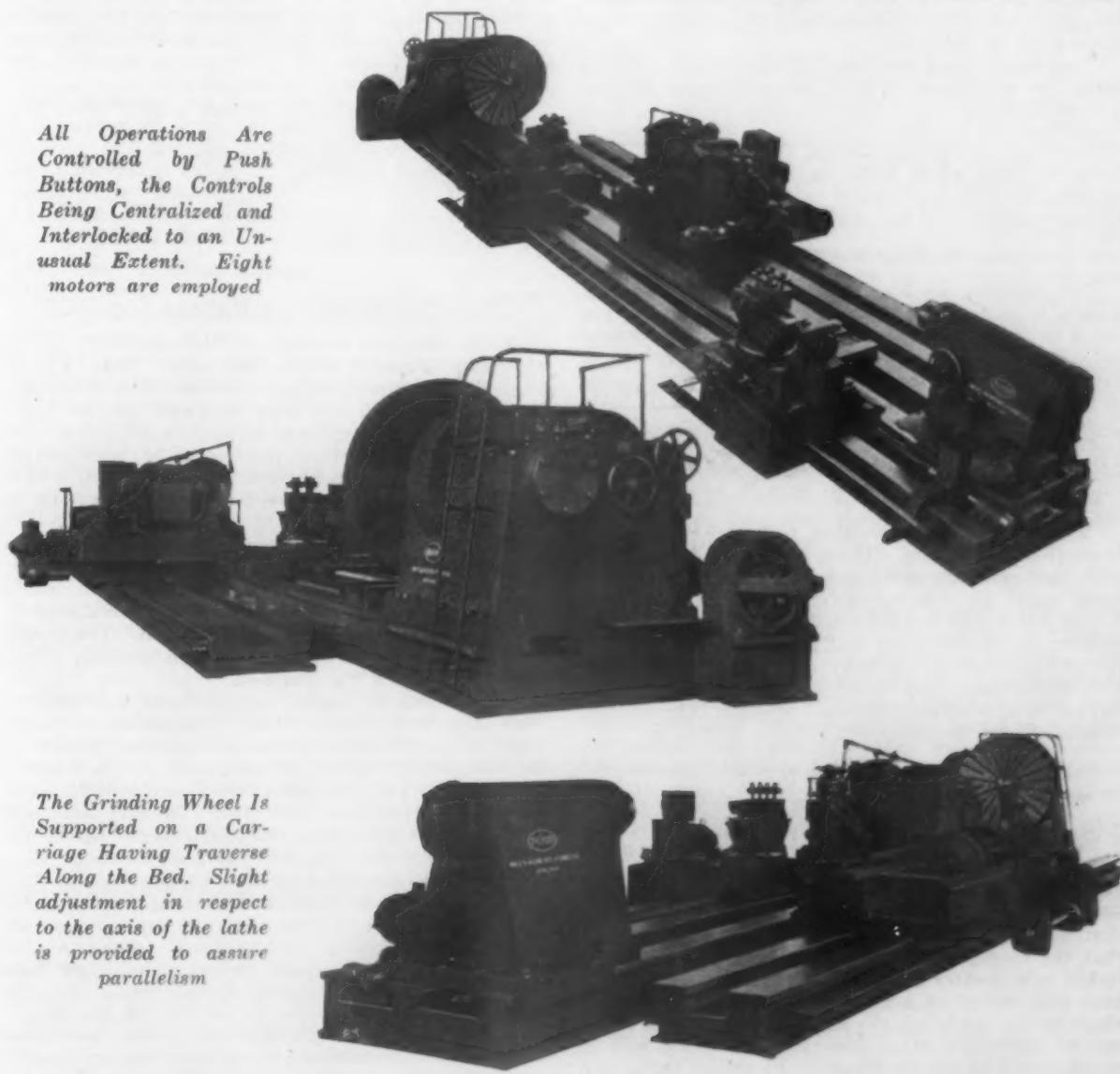
Large Unit Developed for Finishing Generator Rotors Weighing up to 300,000 Lb.
—All Operations Controlled from Push Button Stations

IN recent years electric generators have been built in increasing sizes and the requirements for accuracy and finish of their parts have demanded the design of some unusual machine tools. The rotor of the generator is probably the most important and heaviest single piece, and, as this revolves at high speeds, unusual accuracy is required in the machining of the bearings; an accuracy much greater than normally required on ma-

steel gearing inclosed within the head stock casting. The face plate is 85 in. in diameter and 17 in. wide and is fitted over a projecting nose and bolted to a large flange forged integral with the spindle. The centers are 8 in. in diameter.

The tailstock has a spindle 16½ in. in diameter. Its rear portion extends across the middle and rear shears. The forward part is reduced in width to permit the

All Operations Are Controlled by Push Buttons, the Controls Being Centralized and Interlocked to an Unusual Extent. Eight motors are employed



The Grinding Wheel Is Supported on a Carriage Having Traverse Along the Bed. Slight adjustment in respect to the axis of the lathe is provided to assure parallelism

chine work of this large size. To meet the requirements of work of this class the Niles-Bement-Pond Co., 111 Broadway, New York, has built the combined lathe and grinder shown in the accompanying illustrations, which machine incorporates several notable features.

The lathe will swing work 113 in. in diameter over the bed and 94 in. over the carriages. It is 45 ft. long between centers with tail stock in extreme position. The machine is of massive construction, having been designed for finishing rotors weighing 300,000 lb. which exceeds present requirements for this class of work.

The bed is 13 ft. 8 in. wide over the shears and is 65 ft. long. The portion that supports the work and is subject to the cutting stresses is cast with double vertical plates. The live spindle is 22 in. in diameter in the main bearing and has a speed range of $\frac{1}{4}$ to 30 r.p.m. It is driven by a 75-hp. adjustable-speed motor through

carriage and grinder to be brought close to the dead spindle, and this part is supported by a portion of the middle and rear shears. The tailstock has power movement along the bed, being driven by an independent motor engaged by gearing with a revolving nut on the fixed screw.

There are two carriages, each having cross moving slides and swivel rests and having compound tool rests to permit of independent adjustments for positions and depth of cut. The carriages are arranged to pass the steady rests without interference and an extension bridge is provided for use when it is necessary to have the tool block brought near the axis of the lathe. Each carriage is provided with independent feed and rapid traverse by means of a 10 hp. adjustable-speed motor mounted on it, geared to obtain movements of the carriage on the bed, swivel rest across the machine and

tool blocks on the swivel rests. These motors are so wired with the spindle-driving motor that they will not operate the feed unless the driving motor is up to speed, but can be used to traverse the carriages or parts whether the spindle is revolving or not.

The feed screw is 5½ in. in diameter and is located between the shears of the bed. It is non-revolving and is supported at intermediate points by tumbler bearings. The use of separate motors for feeding permits selection of feeds for each carriage according to the work it is doing independent of the face plate speed, but does not give a fixed relation between the spindle revolutions and travel of carriage along the bed such as is necessary for screw cutting. To provide for this there is a spline shaft extending along the bed driven by gearing within the head stock and transmitting power to the carriage gears. By gear changes within the cabinet on front of the carriage all the usual thread pitches can be obtained.

The steady rest has five adjustable jaws with a range for work from 12 to 40 in. in diameter and has a removable top to facilitate entering the work. It is constructed so as not to interfere with movement of the carriages. For supporting the very heavy work there are two roller rests, each having two rollers mounted in separate cradles to permit the rollers to adjust themselves to the work they are supporting.

Grinder Finishes Journals 60 In. Long

The grinding machine, which is of Landis Tool Co. design, is mounted on the rear portion of the bed and has a grinding wheel 36 in. in diameter, with traverse sufficient to grind journals 60 in. long. The grinder is supported on a carriage having traverse along the bed to permit of grinding in any position between the lathe centers. It is also provided with means for slight adjustment in respect to the axis of the lathe to insure parallelism. The grinder is equipped with a water circulating system and is driven by a 25 hp. adjustable-speed motor.

The wiring to the carriages, tail stock and grinder is carried in conduits. These wires are connected to push buttons on the carriage and grinder with an automatic panel for starting and stopping the main drive motor, which also has its speed adjustment from push buttons on the carriages and grinder. All gearing is inclosed and lubrication is by means of multiple oilers with sight feeds, some of the more important bearings having large separate sight-feed oil cups. The machine weighs 425,000 lb., complete.

All Operations Controlled by Push Buttons

The machine is to be used in the shops of a large manufacturer of electrical equipment. It is electrically driven throughout, there being eight motors on the machine, arranged so that all traverse movements are accomplished electrically. Push-button control of the main driving motor is an outstanding feature. All operations are controlled by push button, with the result that the electrical controls are centralized and interlocked to a greater extent, it is claimed, than has ever been done before on a machine tool. From either carriage or the headstock the main spindle driving motor can be started in either direction or stopped, and its speed varied at will by pressing the proper button. A button at the back of the headstock can be used to jog the motor in one direction or the other, this being particularly for use in lining up the main driving gears so that they may be easily shifted to change the speed of the face plate. A push button station on the grinding machine provides for starting, stopping, and varying the speed of the main motor. The four main control stations each have a "safe" button, which, when pushed, prevents the starting of the main motor from any station. This feature is of value when a man desires to work about the machine itself, or with a cutting tool, and is intended to prevent accident.

Each carriage of the lathe has a separate variable speed feed and traverse motor, which, together with its automatic controller, is mounted on the carriage. These are so connected that it is impossible to start the motor for feeding until the main driving motor has started and come up to speed, and the slow motion

feed gears thrown into engagement. For feeding, the motor runs as long as it is desired to feed the carriage, at a speed determined by the desired feed. For traversing, the push button must be held in contact as long as it is desired to traverse the carriage. The traverse buttons are inoperative when the feed gears are in mesh.

The tail stock is traversed by a motor mounted on the tail stock itself. By means of a drum controller, mounted so that its operating handle is convenient to the operator when he is standing on the tail stock platform, this motor may be run in either direction, and consequently the tail stock may be traversed to any desired position.

There is a small panel board back of the operator's platform on the grinding attachment on which are mounted the push buttons for controlling the main grinder motor, the motor driving the water circulating pump as well as the main driving motor of the lathe itself. The rheostat for varying the speed of the grinder motor is located on this panel.

The grinding machine may be traversed longitudinally and to and from the work by means of a single motor which is started, stopped and reversed through a drum controller. A clutch is thrown to engage one traverse or the other. Another small motor, with a reversing drum controller, traverses the grinding wheel itself to and from the work.

Foundry Exchange Papers for 1925

Word has been received by the secretary of the American Foundrymen's Association that J. E. Fletcher, consultant, of the British Cast Iron Research Association, has been delegated by the Institute of British Foundrymen to prepare the annual exchange paper on foundry practice to be presented at the annual convention at Syracuse, N. Y., Oct. 5 to 9. Mr. Fletcher is one of the foremost foundrymen in England.

Two French exchange papers will be presented on the behalf of the Association Technique de Fonderie de France. One will be by Albert Portevin and Pierre Chevenard, two of the leading French metallurgists, on "Dilatometric Study of Graphitization." The second paper will be by R. de Fleury on "Aluminum Alloys and their Casting Peculiarities."

Dr. H. Ries of Cornell has prepared the fifth annual American Foundrymen's Association exchange paper which will be presented at the June meeting of the Institute of British Foundrymen. G. H. Clamer, past president of the American Foundrymen's Association, will present the 1925 annual American Foundrymen's Association exchange paper before the fall meeting of the French Foundry Association.

This exchange arrangement, inaugurated in 1921, has done much to increase the interest in foundry problems and practices of other countries and has been the means of promoting international understanding among foundrymen. Eight papers in all have been contributed by the American Foundrymen's Association representatives before the meetings of the British and French Associations, and ten papers have been contributed by the British, French and Belgian foundry associations to meetings of the American Foundrymen's Association.

Foundry Instructors to Meet

A special invitation is being extended by the American Foundrymen's Association to all technical school and foundry instructors to meet at Syracuse, N. Y., at the time of the annual convention, week of Oct. 5. An informal gathering is being planned by the committee under the direction of Prof. A. E. Wells, head of the shop laboratories, Cornell University, assisted by John Grennan, University of Michigan, and William Dosey, Carnegie Institute of Technology. Two or three prominent foundrymen are being secured to address a dinner gathering of the group who may accept the hospitality of the A. F. A. After the talks, the meeting will be devoted to getting acquainted.

Jobbers Ask Closer Mill Cooperation

Detroit Convention Favors Steps Eliminating Competition
Between Mills and Jobbers—Cost Finding
Systems Described—Officers Elected

THAT steel warehouses are confronted with immediate and vital problems which must be solved to permit them to do business on a fairly profitable basis was forcibly brought out at the annual meeting of the American Iron, Steel and Heavy Hardware Association held in Detroit last week. These problems pertain to proper size and quality differentials for the jobbers, closer cooperation by mills which will eliminate the taking of mill orders that should go to warehouses and more careful determination of the cost of doing business.

Speakers referred to the keener competition for business in the steel industry as well as economic changes resulting from excess mill capacity and improved transportation facilities which affect the jobbers who must adjust their industry to meet the new conditions. A factor declared favorable to the jobber is the present tendency of consumers to carry low stocks and require prompt delivery service. The association decided to take up vigorously with the mills through a special committee some of the grievances regarding differentials and the taking of orders by mills that jobbers claim should go to them. The association will conduct a vigorous campaign to increase its membership with a view of making it a more representative body of jobbers and may change its name to one that more appropriately applies to an organization of steel distributors.

No Camouflaged Prices Now

THE discussion of the outlook in steel capacity, consumption, course of prices, basing points, importations and standardization was led by Andrew Wheeler, Morris Wheeler & Co., Inc., Philadelphia, chairman of the iron and steel committee. The present over-production of steel, he said, was due to the modernization of old plants and the speeding up of production rather than to the building of new plants. The country now has a steel making capacity for 140,000,000 people and the industry will have to wait till the country grows up to that consuming capacity. While prices are not what they should be, there is no camou-

flaging of prices today, as all distributors know both the Pittsburgh and the warehouse prices.

Mr. Wheeler questioned whether the American Iron, Steel and Heavy Hardware Association is representative of the steel jobbing industry, since many members carry more hardware than steel. Its name, he suggested, is misleading and at present there is no organization truly representative of the steel jobber or warehouseman. He doubted whether the association represented over 40 per cent of the jobbing trade although it should represent 90 per cent of the trade, in his opinion. If the name of the organization were changed to the American Steel Warehouse Association (or some other more suitable name) he questioned whether the association would lose those who specialize on heavy hardware and thought that some of the large steel distributors not now members would be brought in. There are many things which a representative organization of warehouses might accomplish.

Mr. Wheeler emphasized the importance of standardization and spoke of the cutting down of sizes which has been taken up with the Department of Commerce. In his opinion the jobbers have become too obliging to customers who make increasing demands, wanting bars cut to length and other favors. These things happen in a lean market and he doubted whether anything could be done about this situation until conditions change.

Net Profits Averaged Only 4c. Per \$100 Sales

A REPORT on the cost of doing business with charts submitted by A. L. Philbrick, Congdon & Carpenter Co., Providence, R. I., chairman of the cost committee, showed that a larger number of members had cooperated than heretofore in supplying cost data. The reports of forty members were tabulated and the outstanding fact of the summary was that the average net profit of these distributors during 1924 was only 4c. per \$100 of sales. In two districts a loss was shown. This compares with a profit of 4.67 per cent shown in 1923. The net cost of doing business

Many Reasons for Optimism

PRESIDENT C. R. WILLIAMS, Williams Hardware Co., Minneapolis, Minn., reviewed the business situation during the past year and declared that the fact that business has not gone ahead too rapidly should mean a longer period of prosperity than otherwise. One of the developments that has affected conditions and sentiment has been the disposition to discontinue forward buying. With high productive capacity of steel plants, improved transportation, and no fear of advancing prices, it is not necessary for the retail jobber or manufacturer to buy for stocks.

"When we consider present conditions with what we have been through during the past five years," continued Mr. Williams, "we have many reasons for being optimistic. There has been a great increase in the distribution of wealth and purchasing power; we have a large supply of credit at low rates; the dislocation between prices of farm products and commodities has been eliminated. We have eliminated for a time at least the menace of unsound radical experiments. We have at Washington an administration definitely committed to economy and efficiency and as a result the prospect of the gradual elimination of burdensome taxation. There is also the prospect of less governmental interference with business as long as business is conducted along proper lines."

last year was 26.23 per cent of sales as compared with 22.36 per cent during the previous year. The leading items of expense last year were administrative, 8.57 per cent; warehouse and delivering, 5.93 per cent; selling expense, 6.89 per cent; fixed charges, 3.03 per cent.

E. P. Sanderson, in discussing this report, said that the cost of doing business is the most important matter before the jobbers today. Too much attention has been paid to quantity, service and turnover and not enough to profits. He referred to long established houses that had failed in recent years and predicted that others will go the same way if they do not know the cost of doing business.

W. C. Hulshizer, Harold McCalla Co., Philadelphia, urged every dealer to affiliate with his local association, saying that all would benefit from the exchange of views. The chair spoke of the need of local associations to handle local problems, some of which might otherwise become widespread.

Taking up the subject of extras, G. K. Conant said that mills should provide greater extras on the smaller sizes. As the cost of these sizes is more, the percentage of profit for the distributor is less than on the

larger sizes. He believed the situation, particularly in respect to steel bars, would be helped if they could get some of the large warehouses not members to join the Association. Another speaker said that the mills should reestablish the old warehouse extras but that the mills would not listen to that suggestion.

that warehouses should not take business that should go to mills. However, as warehouses are not as strict on credits as some of the mills, there are cases where warehouses can take some business that mills would not be willing to accept. One suggestion was that there should be differentials that would have a relation to mill output with higher differentials on sizes for which there is not much demand.

There was some discussion of the method which should be followed in order to secure the cooperation of the manufacturers regarding size and quantity differentials which the jobbers regard as unsatisfactory. A special committee of three was appointed to handle this matter with the mills.

Are Fixed Resale Prices Feasible?

ROSS R. HARRISON, Bryden Neverslip Co., New Brunswick, N. J., declared that a fixed resale price is a restraint of trade and not permitted under law. In his opinion not much could be accomplished until the Sherman law is amended so that fixed resale prices are legalized. Bills have been introduced in every session of Congress since 1915 to amend the Sherman law, and he suggested that a new bill be introduced into

Imports Still Troublesome

IRON and steel jobbers on the Atlantic coast are injured by the competition of Belgian steel, said Andrew Wheeler, Morris Wheeler & Co., Philadelphia. If jobbers persist in buying foreign steel, it weakens their position with those American mills now suffering from the unfair advantage of the freight rate from Antwerp as compared with the rate from Pittsburgh to Philadelphia. This is a serious condition for mills and blast furnaces, particularly in eastern Pennsylvania, in his opinion, and he suggested that an appeal be sent to the President to have the tariff raised if imports are not stopped. W. F. Vosmer, general manager of sales, Donner Steel Co., Buffalo, noted that recently 1100 tons of foreign steel bars were brought to New York for the jobbing trade. He pointed out that the buyers would have little recourse if the bars prove unsatisfactory. Importations of steel will not last long, in his opinion, since foreign prices are apt to increase as conditions improve abroad. E. J. McCarthy, Beals, McCarthy & Rogers, Buffalo, said that importation of foreign steel has been entirely eliminated on the Pacific coast. He said that warehouses there paid 2.65c. for foreign steel when domestic steel was 2.10c. Pittsburgh. Then the mills began selling the jobbers' customers at 2.40c. and the jobbers quit selling foreign steel and got their price back to 3.30c.

larger sizes. He believed the situation, particularly in respect to steel bars, would be helped if they could get some of the large warehouses not members to join the Association. Another speaker said that the mills should reestablish the old warehouse extras but that the mills would not listen to that suggestion.

Extras Form Real Problem

VARIOUS other suggestions and complaints were made. One was that the jobbers get full extras from the small lot trade and another was that if the jobbers print mill extras, the consumers will not pay any higher extras. To correct this situation the jobbers should revise their own printed list of extras. Mr. Williams said there is no profit for the jobber in small sizes and small quantities and consequently the condition of the market is likely to be weak for a long time. He believed many of the large warehouses made their money by price fluctuations.

Mr. Wheeler expressed disapproval of eliminating extras on cold rolled steel. He declared that it is bad practice to do away with well established extras and that instead of abandoning the old extras, they should look forward to an increase in extras. In Philadelphia, he said, where they have a local condition, there is a warehouse extra which is three-fourths of the old full extra. He believed mills should refrain from taking business that should go to warehouses and

the next Congress and that the Association aid in securing its adoption. A motion was adopted providing for the appointment of a committee of three to act with other organizations in trying to secure the desired amendment to the Sherman law.

Later, when the subject of horseshoes was being discussed, A. W. Sexsmith, Phoenix Horseshoe Co., declared that 75 to 80 per cent of all horseshoes are sold on a resale price and he thought the law clearly permitted the naming of a resale price. While no agreement is permissible, he said, the manufacturer has a legal right to say to the distributors that if they do not maintain the resale price, they will get no more goods. Mr. Sexsmith also discussed toe calks. He advocated a larger differential for these, the cutting out of very small distributors and allowing some of the business to go to jobbers that now goes to manufacturers.

H. A. Sadler analyzed the operation of salesmen's automobiles. He said a questionnaire was sent to twenty-five concerns on this subject. The replies showed that two principal methods of operation are followed, one for the salesman to own his automobile and be paid a fixed rate for all expenses. The other plan is for the jobber to own and take care of the upkeep of the car. The opinion was general that the salesman should own his own car and be allowed a fixed rate for his expenses.

George K. Conant, Sligo Iron Store Co., St. Louis, explained that up to the present he has seen no changes in the price situation in his territory due to the Jones & Laughlin decision but thought it possible that after the next serious depression Chicago prices would be lower than Pittsburgh prices in the St. Louis territory.

On the motion of John B. Carse, Ogden & Wallace, New York, the appointment of a committee was authorized to consider the subject of the handling of fabricating material and to confer with committees of the American Institute of Steel Construction and of the architectural iron workers.

The meeting was held at the Hotel Book-Cadillac, Detroit, May 19-21, and was well attended, the registration being approximately 200.

The principal entertainment feature was a dinner dance given Wednesday evening. Golfing and other entertainment were provided for the members and an

automobile ride for the ladies. Many of the members accepted invitations to visit the Highland Park plant of the Ford Motor Co. and the plant of the Dodge Brothers.

Officers for the ensuing year were elected as follows: president, G. M. Congdon, Congdon & Carpenter Co., Providence, R. I.; first vice-president, G. K. Conant, Sligo Iron Store Co., St. Louis; second vice-president, E. McK. Froment, Froment & Co., New York; executive committee for three years, Harrison I. Potts, H. D. Potts & Son Co., Philadelphia, and William J. Dean, Nicols, Dean & Gregg, St. Paul, Minn.; for two years, Albert J. Bragg, Eggleston Brothers & Co., New York; for one year, Clarence D. Dodge, G. F. Blake, Jr., Co., Worcester, Mass. President-elect Congdon was not at the meeting, owing to his absence abroad. He is expected home from Europe this week and after his return will appoint the special committees authorized during the convention.

Do Mills Infringe On Jobbers?

What Is the Margin Which Should Separate Jobber and Direct-Mill Tonnage?

UNDER the stress of hand-to-mouth buying on the part of consumers, many jobbers have resorted to the expedient of small mill shipments to enable them to maintain a profit. Sometimes the mills accept orders which the jobbers claim should have gone through their hands. The question of what constitutes a mill order was thoroughly discussed at the annual meeting of the American Iron, Steel and Heavy Hardware Association in Detroit last week.

W. F. Vosmer, general manager of sales, Donner Steel Co., Buffalo, declared that the subject of distinction between a warehouse and mill order is very important. Too many jobbers, he said, ask mills to ship direct to their customers. When there is a difference of \$1 or \$2 a ton between the mill and warehouse price, they take that as their profit, which is not enough. He spoke of one mill order of 40 tons in 39 sizes which, he said, was jobbers' and not mill business. He suggested that the mill extra now covering one ton of a size be extended to cover 5 to 10 tons of a size, as that would protect the jobbers. In his opinion the number of sizes particularly in flats should be reduced.

A. J. Dietrich, Dietrich Brothers, Baltimore, favored a closer relationship between warehouses and fabricators and a closer working arrangement between warehouses and mills. Anything less than a 200-ton order should in his opinion go to a jobber. He noted that in Baltimore some contractors would place an order for 200 tons with a mill and buy small lots from a jobber to use before the mill shipment arrived.

W. W. Hall, Republic Iron & Steel Co., Youngstown, Ohio, held that small lot business belongs to the jobber

and that a mill extra on 5 tons would thus be welcome.

R. E. Belknap, Bethlehem Steel Co., Boston, remarked that his company is getting orders for as small lots as 500 lb. of one size from a jobber and asked if it is not possible for a jobber to anticipate his needs and buy in larger lots. His company does not solicit 1000 lb. orders but at times has to take orders of that size from regular customers. The tonnage of foreign steel that is coming in is increasing around New York, Boston, New Orleans and Savannah, according to Mr. Belknap. Steel manufacturers do not feel that this is the time to cut wages and consequently cannot meet this competition.

In some cases jobbers take orders for prompt mill shipment at mill prices, said Andrew Wheeler, Morris, Wheeler & Co., Philadelphia, and occasionally may have erred in so doing but it is more often the case that mills take orders which should go to warehouses. It would take considerable effort on the part of jobbers to refuse to buy from mills which take small orders that should go to the jobber.

W. B. Todd, Jones & Laughlin Steel Co., declared that the mills would be glad to stop taking small orders and believed they would welcome suggestions as to where the line should be drawn between a mill and a warehouse order. R. H. Sanderson, E. P. Sanderson Co., said the New England jobbers are opposed to the elimination of the quantity differentials. He declared that the cutting out of the \$10 a ton differential eliminates a large share of the distributors' profit and jobbers have been badly hurt by the change. Other members also expressed the disapproval of the elimination of the quantity differential.

Uniform Cost Finding System Ready

Bolt and Nut Association Uses Method in Force at Bethlehem Steel Co.

R. H. SANDERSON, Boston, chairman of the bolt committee, opened the discussion on bolt material. He declared that there has been too much vacillation on the part of bolt manufacturers. They have put the delivered prices into effect with a 1000 lb. limit compelling small consumers to buy from jobbers. However, they did not give the plan of delivered prices a fair trial and he hoped they would reconsider their action. Normalcy as it exists at present, according to the speaker, is trying to get business at any price.

C. J. Graham, president of the Bolt and Nut Manufacturers' Association, declared that a new era is at hand and new ways of doing business must be figured out. A survey showed that capacity was 40 per cent

more than required. Makers tried to fill their plants which resulted in the extremely low prices of 1923 and the early months of 1924.

A uniform cost accounting system was taken up first and it was decided that the Bethlehem Steel Co. had the best system. This company loaned a force of employees to assist the bolt and nut people in working out a system and the matter was discussed at a meeting attended by 56, held at the Bethlehem plant six weeks ago. Members who were formerly lukewarm are now optimistic over the uniform cost accounting system. The committee is now about ready to give the system to the trade. Mr. Graham said that the Bolt and Nut Association is also cooperating with the

Department of Commerce on simplification and that a committee is now working with the Department of Commerce on a standard package for shipment to jobbers which will result in a great saving to the trade. The association is also trying to increase consumption. Some of the railroads and other large consumers of large bolts are making their own bolts and the association is trying to show these consumers that they can buy bolts cheaper from regular manufacturers than they can make them. If these consumers can be persuaded to discontinue making bolts, the 40 per cent excess capacity will be cut down somewhat.

Profits Unsatisfactory

THE efforts of the bolt manufacturers in the speaker's opinion will result in a stabilization of prices, in better manufacturing conditions and in general im-

provement in the industry. Bolt and nut manufacturers, he said, must figure to do business on a reasonable margin of profit and not speculate. Consumers are no longer buying in a speculative manner. The buyer should help to stabilize market prices when they are fair. Prices are so low today that a change of five per cent would put some manufacturers back into red ink. Mr. Graham said that 38 out of 75 bolt and nut manufacturers belonging to the association consumed 697,600 tons of steel in 1924, their product brought \$72,500,000 and they lost \$7,016,000.

I. L. Jennings, sales manager, Lamson & Sessions Co., Cleveland, expressed the opinion that present prices would continue through the next quarter. He believed that manufacturers are unable to get larger margins and the only way to help their situation is to find some way of reducing costs.

Cold Finished Steel Distribution

Affected by Three New Factors Which Make New Methods Necessary

DEVELOPMENTS in the production and distribution of cold finished steel were discussed at considerable length at the annual convention of the American Iron, Steel and Heavy Hardware Association in Detroit last week. E. S. Hoopes, president Union Drawn Steel Co., Beaver Falls, Pa., spoke of the tremendous growth of the cold drawn steel industry from the early days of the shafting business when there were only a few sizes and material was usually satisfactory if it was pleasing in appearance. The normal consumption is now 1,000,000 tons per year and with this great increase, manufacturers face many new technical problems. In addition to the wide range in physical properties and chemical analyses buyers have size requirements that must be met. The finishing mills are trying to meet these problems as they arise but the work is growing harder despite efforts to reduce the number of grades and sizes.

The cold finished steel situation was analyzed at considerable length by A. J. Lockwood, president Edgar T. Ward's Sons Co., chairman of the committee on cold finished steel. He declared there is a universal feeling of uncertainty and only a few realize that certain fundamental changes have been under way and are affecting the entire industry. The cold finished steel bar situation, as far as mill supply quality and service are concerned, is better than ever. As to prices, there is little change as regards the merchant although the manufacturer is working at a lower spread between hot rolled steel and cold finished products (cost considered) than ever before. The opinion is general and is substantiated by records of many companies that the volume of cold finished steel bar business for the jobbers is less than 5 or 10 years ago although production and consumption for the past three months has been greater than a year ago and is far in excess of 1914.

There are three principal contributing factors in the present cold finished steel situation, according to Mr. Lockwood. The most important is the increased capacity that resulted from 1915 up to 1920 which is far in excess of present market requirements. The normal requirements as represented by present conditions are estimated to be 50 to 60 per cent of capacity. Under these conditions mills take a class of business they formerly considered undesirable or from consumers who heretofore looked to jobbers as their only source of supply. The second factor is the change in basing points which has limited the profitable marketing area of every manufacturer, resulting in keener competition among the manufacturers and the jobbers. The third factor is improvement in transportation facilities so that a mill can now make deliveries in one to three days in its natural trading territory and can deliver car lot shipments from Pittsburgh to Pacific Coast points in thirteen or fourteen days as compared with five to eight weeks a few years ago.

These three factors are permanent economic changes affecting all jobbers and it is necessary for jobbers to adjust themselves to these conditions. They must improve their methods in doing business if they are to continue successfully. The consumer is the final judge as to his source of supply, Mr. Lockwood pointed out, being governed by quality, delivery and price. In the case of cold finished steel bars quality, in a broad sense, has become standardized and the jobber can usually render better delivery service than a mill, leaving price as the one highly competitive factor.

Recently some changes were made which helped the price situation. The 50c. extra per 100 lb. for hexagons and the quantity differentials have been eliminated. The arbitrary differential for hexagons was, he said, almost a prohibitive burden to many small screw machine operators and the differential alone made the difference between profit and loss on most of the work and forced most of the smaller consumers to turn to mills for supply. He remarked that the quantity differentials had not been uniformly maintained for some time and in some sections had been entirely or partially abandoned long ago. These quantity extras are necessary for the mills but certain large jobbers have not been favorably disposed to a continuation of this change. Now that the quantity differentials have been eliminated at nearly all points, there is a better feeling and the jobbers should be in a better position to compete for some business that has been going to manufacturers.

The three economic changes mentioned are the three underlying causes which in the speaker's opinion make the change in the jobbers' method of doing business necessary and it seemed to him that price is the principal factor that will assist the jobber in regaining a strong position in the steel trade.

No Increase In Consumption

THERE is nothing to indicate a substantial increase in volume, he continued. Too many are looking for profits measured by the boom years. An ideal condition of prosperity would be a stabilization of prices and a production evenly balanced year after year. Under such conditions the curve of prices would remain almost flat and there would be a fair but not a speculative profit. This is the time when efficient business management will mean more in profit than at any time in the past ten years. In the new order of things there are some favorable opportunities for the jobber, especially the well-managed organization which keeps in touch with the changing conditions in the local market. He referred particularly to low stocks that consumers are carrying and to the fact that large inventories are now regarded as both dangerous and unnecessary. This offers the jobber an opportunity for the immediate service required by the customer.



Shipping Board Vessels Which Have Been Tied Up Near Jones Point, Hudson River, Since the War

Heavy Scrap Tonnage in Idle Ships

**Close to Half Million Tons in Shipping Board Vessels
Which Henry Ford Is Ready to Buy from
Government at a "Fair Price"**

HENRY FORD'S offer to purchase at a "fair price" about 400 of the idle ships of the United States Shipping Board, as announced recently by T. V. O'Connor, chairman of the Shipping Board, following an interview with Mr. Ford, is regarded with unusual interest by some of the larger dealers in iron and steel scrap and also by those steel companies which are frequent purchasers of heavy melting steel.

Experts of the Shipping Board are now making a survey of the Government boats to determine which ones shall be offered for sale and also to determine the amount of salvage material that these boats contain. The Shipping Board has more than 1200 ships, of which, according to Mr. O'Connor, 400 could be kept for operation, 400 kept in reserve and the remaining 400 can be scrapped, because the last named can never be profitably used, being for the most part small tonnage boats which are not economical carriers under present conditions of ocean transportation.

The smaller types of ships are the ones to be sold, except where some of the larger boats may have deteriorated beyond the possibility of repair at reasonable cost. These small boats, running from 3500 to 4000 tons deadweight tonnage, have roughly about 1400 tons of steel scrap each and in 400 ships this would total about 560,000 tons. Of course there are boilers, machinery and other ship equipment which would yield a fair price over and above the price of the scrap taken out for remelting purposes.

Although in some quarters Mr. Ford's offer to bid on these vessels for the purpose of scrapping them is apparently regarded somewhat seriously, in other quarters, notably in the scrap trade, it is not so regarded. "When the proposition is analyzed," said a prominent scrap dealer whose sales total fully a million tons a year, "we find that the Ford Motor Co. would have on hand nearly a half million tons of steel

scrap after scrapping 400 of the Shipping Board vessels. If the open-hearth furnaces the Ford Motor Co. is building were to consume a hundred thousand tons a year, which is a high estimate, this scrap pile would last for five years."

Construction of four 100-ton open-hearth furnaces, which are to be supplemented by a blooming mill and a merchant bar mill, will be completed some time this year at the River Rouge plant of the Ford company. It is estimated that these furnaces will produce 15,000 to 20,000 tons of steel a month when working at maximum capacity. With a 50 per cent scrap mixture they would consume from 90,000 to 120,000 tons a year, and the probability is that even the minimum figure is high, as the automobile industry does not work at maximum pressure the year around.

In the newspaper accounts of Mr. Ford's offer to buy the Government ships there was an inference that such a sale could be consummated by private negotiation between the Shipping Board and Mr. Ford's company. The fact is, however, that bids will have to be advertised for and the highest bidder will be awarded all of them or such parts as he may desire. The probability is that the ships would be sold in parcels, as was done with the naval ships which were scrapped as a result of the agreement reached at the Limitation of Armament Conference in President Harding's administration.

In the case of the naval ships it was understood that all of these ships had to be scrapped. In the case of the Shipping Board vessels it will be possible, of course, for the successful bidder or bidders to fit out some of the ships for operation if they care to do so. In fact Mr. Ford, in his statement to Mr. O'Connor, said that a few of the ships, if he bought them, would be retained for the purpose of carrying Ford automobiles and tractors to other countries. This fact might

make it possible for the Ford company to bid somewhat higher than would a company whose purpose was to turn all of the ships into remeltable material.

Chairman O'Connor made this statement in connection with his announcement of his interview with Mr. Ford:

"The Shipping Board is the sole judge of what ships it is willing to sell for scrap and what ships it is willing to sell for operation. When we designate ships for scrap I hope that they will be sold and sold in large numbers with no waste of time. To keep useless ships longer is an insult to public intelligence. . . .

"What we want is responsible bidders for Government ships on a large scale, who are real Americans like Henry Ford and others."

Mr. Ford estimated that it would cost \$400,000 for his company to scrap 400 ships. This figure is considered by some in the scrap trade to be very low. Those who have had experience in the scrapping of naval vessels assert positively that it is low. Figuring on

only 400,000 tons of remeltable steel and ignoring the other salvage this amount would be about \$1 per ton of scrap.

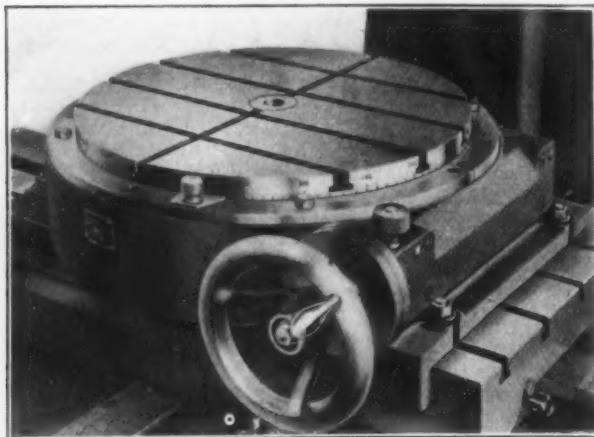
The Navy Department, after receiving bids for the sale of some of the warships to be scrapped under the international agreement, decided it would be money ahead by scrapping some of these boats in navy yards and selling the material after it had been cut to shipping sizes. The scrapping of the Navy vessels was somewhat easier, it is stated, because these ships were on the ways, whereas the Shipping Board vessels are in the water and will have to be cut away down to the water line, and then the hull will have to be beached or hauled into dry dock for completion of the job.

Some members of the scrap trade will doubtless be bidders for the boats whenever the Shipping Board gets ready to advertise them for sale. Most of the scrap would find ready acceptance at American mills, as it would be better quality than much of the heavy melting steel now available.

Rotary Table for Circular Indexing

A new circular table for accurate indexing has been placed on the market by the Pratt & Whitney Co., Hartford. Although developed primarily for use with that company's jig boring machine, the table may be employed also on other types of machine tools where accurate circular indexing is required. The top surface of the table, which is here illustrated, is 20 in. in diameter, a size adapting it for a large variety of work. The table is a unit in itself and requires no setting up or special preparation other than fastening it to the machine table by means of four ordinary T-bolts.

The device is made up of a cast iron base and the



Rotary Table for Use in Tool Room and Production Work. It is fastened to machine table by four T-bolts

circular table top, the latter having a large worm wheel as an integral part of itself. The worm wheel is driven by a hardened and ground worm which in turn is driven by a large handwheel at the front of the table. One revolution of this handwheel rotates the table through 3 deg. The outer edge of the table is graduated in degrees for approximate indexing by means of this large handwheel. For exact setting there is a small slow-motion handwheel which connects to the worm shaft through a second smaller worm and wheel, and by means of this slow motion handwheel the table can be indexed with extreme accuracy. For this final setting there is a large graduated dial on the worm wheel shaft which is provided with a vernier and is so subdivided that the table may be accurately set to 5 sec. This accuracy is equal to 0.00025 in. on a 10-in. radius. A binder is provided for locking the table in position during the subsequent machining operation.

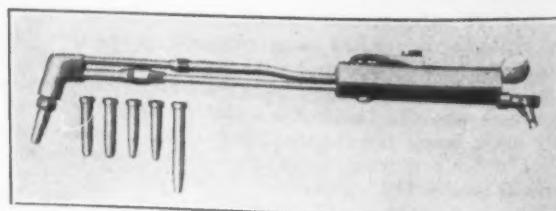
Special processes have been developed for cutting

the large worm wheel and the worm is finished ground all over to close accuracy. The table has an accurately scraped under-surface which is protected by two cast iron lips which project below it. These lips form a rest for the table when it is removed from a machine and placed on bench. In this way the accurately scraped under-surface is protected from damage and at the same time the handwheel shaft will not be sprung due to careless handling.

The rotary table has been found useful for a large number of toolroom and production jobs. It is stated that the table permits the use of polar dimensions, or the angle and the distance from the center, which is claimed to be a faster method of laying out circular work or a series of circular holes than by using the right angle dimensions, as might otherwise be necessary. Used in conjunction with a drilling or milling machine, the table is said to have a wide variety of uses and is claimed to have solved difficult jobs which ordinarily take many hours of set-up time.

Low Pressure Combination Cutting and Welding Torch

A combination cutting and welding torch which is claimed to operate on either low pressure or high pressure gas with equal efficiency, but has been designed especially to operate with low pressure acetylene gas, city gas or hydrogen, has been added to the line of the Alexander Milburn Co., Baltimore.



Tips Are of Solid Copper and Are Interchangeable

This torch incorporates the standardized parts of the company's cutting and welding torches and is adapted to perform welding, as well as cutting work merely by interchanging the tips. The torch is made up of bronze forgings and special seamless tubing. The tips are of solid copper and are interchangeable with a large number of low pressure torches of other makes.

Of 53 names added to the membership roll of the Institute of Metals, London, England, 31 are resident in Great Britain and 22 abroad. The institute's total membership is now 1614, of which 387 are resident outside of British Isles.

INSPECT NEW PLANT

Large Party Visits New Coke Ovens and Site for Blast Furnace at Troy, N. Y.

FORMAL inspection of the property of the Hudson Valley Coke & Products Corporation adjoining the plant of the Burden Iron Co. at Troy, N. Y., was made a special event on Thursday, May 21, when officers and directors of the corporation, city officials of Troy, Albany and Schenectady, bankers, editors of business papers and newspapers and many other invited guests were escorted to points of interest and later entertained at luncheon at the Troy Club.

At the luncheon it was pointed out by several speakers that the construction of the by-product ovens and blast furnace of the Hudson Valley Coke & Products Corporation may usher in a new industrial development of the manufacturing district surrounding Troy. Already three or four New England foundries, which are handicapped by high freight rates on incoming raw material and on outgoing finished product, are contemplating locating near the plant of the Hudson Valley corporation, and expansion of the latter enterprise is expected to follow as a matter of course.

The by-product ovens and blast furnace are being located at Troy as a result of the economic change which high freight rates have wrought in the coke and pig iron situation. In former days blast furnaces were nearly always located convenient to sources of coke and ore. Today the freight rate on the pig iron has become such an important factor that some furnaces, once considered fairly well located, are now finding profitable existence a difficult matter because of being separated from some of their logical markets by high freight rates.

The development of the Hudson Valley property will be watched with interest in the pig iron industry from another angle, and that is because of the growing conviction in some circles that to be manufactured profitably under present highly competitive conditions pig iron must become a by-product of a coke plant.

To Supply Gas to Several Cities

The Hudson Valley Coke & Products Corporation has entered into a long-term contract with the municipalities of Troy, Albany, Schenectady, Cohoes, Rensselaer and Watervliet for the sale of gas, which will amount to about 16,000,000 cu. ft. per day, and a 17-mile pipe line is being laid to transport gas from the coke plant to central stations in these cities. Of the coke which will be produced, amounting roughly to 365,000 tons a year, about one-half will be used in the blast furnace, foundations of which are being laid, and the remainder will be sold to foundries and for domestic heating furnaces. By-products will amount to 5,300,000 gal. of coal tar per year, 14,000,000 lb. of ammonia sulphate and 17,500,000 gal. of benzol, which will be refined for motor fuel.

The blast furnace, with 450 tons per day capacity, will produce 150,000 tons of pig iron per year, and it is asserted that there is an ample market for this within a short radius of Troy. The furnace will have a freight rate advantage of about \$1 a ton over Buffalo and eastern Pennsylvania furnaces into New England, and for delivery to points in the capital district of New York State the advantage will be greater.

Ultimately the plant will have three batteries of 55 coke ovens, but only one of these is now being built, and it will soon be ready for firing. Only the foundation for the blast furnace is in, but the steel work is being fabricated and the contract calls for the completion of the furnace ready for operation by Oct. 1. A second furnace is included in the plans for the plant, but it will not be built until the demand has been created for its product.

The by-product ovens were designed by the Foundation Oven Corporation, a subsidiary of the Foundation Co., 120 Liberty Street, New York, and this installation is the first that has been made in this country, but an experimental plant of 30 ovens was built at Anyox, British Columbia, and has been in successful

operation, being owned by the Grany Consolidated Mining, Smelting & Power Co. A description of the Foundation ovens appeared in THE IRON AGE of April 10, 1924, p. 1075.

Blast Furnace Design Conventional

The Hudson Valley blast furnace is the design of Julian Kennedy, well known steel and blast furnace engineer, and the erection will be superintended by S. O. Hobart, now in charge of blast furnace operations at the Warwick furnaces of the Eastern Steel Co., Pottstown, Pa. Engineers of the Hudson Valley corporation say that the blast furnace design follows principles which have proved successful elsewhere and that no innovations have been attempted. The furnace will occupy the same site as that occupied for many years by the Burden furnace, which was completed in 1906 and dismantled only a few months ago. One of the blast stoves of the Burden furnace will be utilized in connection with the new furnace.

The Hudson Valley Coke & Products Corporation is an enterprise in which four well-known interests joined hands, these being the Burden Iron Co., Troy, N. Y., the Oliver & Snyder Steel Co., Pittsburgh, the Foundation Co., New York, and E. Arthur Tutein, Inc., Boston, New York and Philadelphia, the latter forming the distributive factor in the organization. James A. Burden is chairman of the board of directors; Henry Oliver of the Oliver & Snyder Steel Co. is president, and John W. Doty, president Foundation Co., is vice-president. Directors, in addition to these three, are Franklin Remington, chairman of the board of the Foundation Co.; E. Arthur Tutein, pig iron merchant, Boston; I. Townsend Burden, Burden Iron Co.; J. O. Eaton, banker, Cleveland; J. Stanley Davis, banker, Albany; John Jenkins, Oliver & Snyder Steel Co., Pittsburgh; C. Minot Weld, Weld & Liddell, consulting engineers, New York, and W. E. Millhouse, manager Burden Iron Co.

Nearly a Hundred at Luncheon

With one or two exceptions all of the directors were present at the formal inspection. Others in attendance included the following:

William H. Wright, manager of coke ovens department, Foundation Co., New York.

L. Leigh Willard, consulting engineer, New York.

Charles A. Otis, Otis & Co., bankers, Cleveland.

S. O. Hobart, Pottstown, Pa.

Victor Starzenksi, manager Schenectady division, Adirondack Light & Power Co.

John D. Myton, United States Engineers' Office, Albany.

Dr. Palmer C. Ricketts, president Rensselaer Polytechnic Institute.

Dexter Tutein, Philadelphia, E. Arthur Tutein, Inc., pig iron and coke.

F. W. T. Amis, 2 Rector Street, New York, importer of iron and steel.

H. Arnold Wilson, managing director Williams Jacks & Co., Ltd., Glasgow, Scotland.

James A. Burden, Jr., New York, who will be assistant manager of the Hudson Valley plant.

William H. Blauvelt, New York, consulting engineer.

The total attendance at the luncheon, at which James A. Burden presided, was close to a hundred. There were speeches of felicitation in which the mayors of the capital district cities and others pointed out the good fortune of Troy in being selected for the location of the new plant. Some of those closely connected with the enterprise predicted that within five years the initial investment of \$6,000,000 would be swelled to many times that figure and that the coke plant and blast furnace would attract many industries using these products to locate in Troy or vicinity.

The American Engineering Council, through its administrative board, meeting at the Philadelphia Engineers' Club, May 8 and 9, voted to undertake an exhaustive investigation of the aircraft situation. The various aspects of the problem, military and civil, will be thoroughly sifted by a special committee, which is expected to occupy one year in the task at an estimated cost of \$50,000.

Utilizing a Shaper for an Unusual Job

An unusual shaper job is here shown. The piece on the machine is known as a three-part plug for a wood pulp machine. The machining of the slots presented a difficult problem, as the piece was awkward to handle and it was rather difficult to determine the best manner in which to finish the slots. It could have been done on a large level gear generating machine, but the company doing the work does not use bevel gears and did not feel justified in buying such a ma-



With Special Work Holding Fixture, the Slots Were Finished by Means of the Shaper

chine for the operation. The same situation applied to the consideration of doing the work by planing.

The problem was presented to Gould & Eberhardt, Newark, N. J., to see if they thought it could be done on a shaper. As the longest slot was 26½ in., it was found by working up a suitable work holding fixture that the shaper would be altogether satisfactory.

The illustration shows how this piece was mounted to bring the slots parallel with the ram. A notched indexing plate afforded means for accurate indexing from one slot to another. The shaper was grounded into a solid concrete foundation and the table vise and cross slide were removed.

Due to the compact design of the shaper, it proved to be a simple matter for the operator and is regarded as proving how an unusually large piece of work can be done in an inexpensive machine.

British Foreign Steel Trade in April

WASHINGTON, May 26.—Exports of iron and steel from Great Britain during April amounted to 297,458 gross tons, a loss of 5 per cent from the preceding month, Acting Commercial Attaché Mitchell, London, reports to the Department of Commerce. Tin plate was the commodity in which the decline was most noticeable. On the other hand, ingots, blooms, billets and slabs jumped from less than 1000 tons to more than 6000 tons.

Imports of iron and steel continued their upward trend, reaching 274,424 tons in April, as against 244,921 tons in March. Ingots, blooms, billets and slabs registered the heaviest increase.

Ground Flat Stock Available in New Sizes

The line of ground flat stock offered by the Brown & Sharpe Mfg. Co., Providence, has been enlarged to include three new thicknesses, 3/64 in., 5/16 in., and 3/8 in., and six new square sizes ranging from 1/4 in. to 1 in. sq. New widths also have been added, the ground flat stock now being available in widths from 1/2 in. to 6 in. in some thicknesses.

The material is of first quality tool steel, cut and annealed, then accurately ground to thickness. With the new sizes noted above, the line includes 12 different thicknesses, from 1/64 to 3/8 in., correct to one-thousandth of an inch. Each piece of stock is 18 in. long. This stock is used for making test tools and gages,

punches, machine parts, templates, fly tools, dies and cutting tools. It is offered as eliminating the necessity of carefully grinding stock to size for such purposes, and as assuring a stock uniformly annealed with no hard spots.

Production Meeting of Automotive Engineers in September

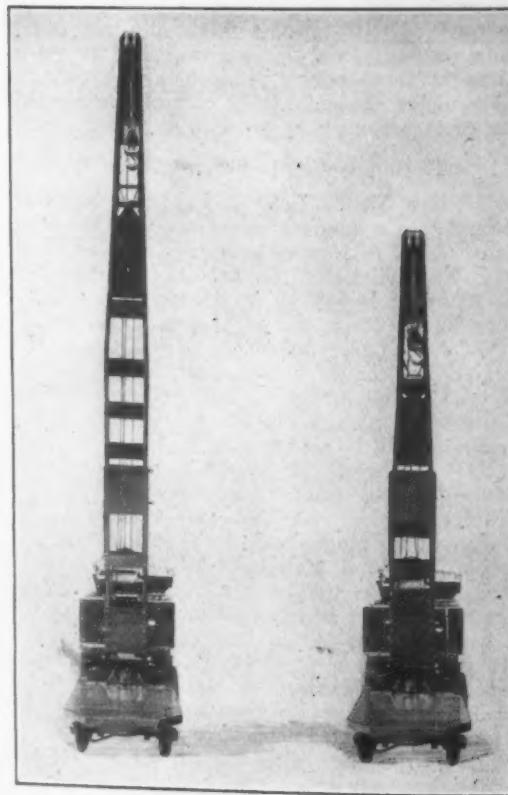
Subjects have been accepted as follows for the production meeting of the Society of Automotive Engineers, to be held in Cleveland, Sept. 14, 15 and 16: a session dealing with experiments and gages; a session on gears with a discussion on the various power transmitting problems; a session on sheet steel and its fabrication; a session on training of foremen and mechanics; a session on machine tools, with particular attention paid to a discussion on the life of machine tools and their economies in practice. A paper is probable on heat-treating from the production man's standpoint.

The meeting will be held simultaneously with that of the American Society for Steel Treating. The outstanding feature of the week's program will be the exhibit of machine tools and equipment for heat treating in the Cleveland Public Auditorium.

Portable Crane with Telescoping Boom

The latest improvement to the Elwell-Parker type CK portable electric crane is a telescoping boom with four settings between 12 and 17 ft.

The boom is of steel, raised or lowered by a special set of cables operated from an electric hoist with two grooved drums. The second drum carries the separate 3/8-in. plow steel non-twist cable to a two-part line-hook



The Boom Is Raised or Lowered by Special Set of Cables Operated from the Hoist

block sheave on the boom tip. The boom side channels are latticed and gusseted with a continuous 1/4-in. steel plate.

The distance from top of the boom to the hook is only 23 in. This has been accomplished by suitably locating the trip switch. The design is advantageous in low head room or reaching over a gondola car or motor truck.

Brittleness—Peeling—Hardness

Characteristics of Steel and Malleable Iron Discussed
by Iron and Steel Institute
in Great Britain

LONDON, ENGLAND, May 9.—The meetings of the Iron and Steel Institute on the concluding day* opened with an announcement of the Carnegie Scholarship awards, which included the following:

Walter Crafts, Reading, Pa., £100 to assist him in carrying out a research on the production of carbonless chromium by the method of leaching and electrolytic definition of chromium from chromite.

A. L. Curtis, Chatteris, Cambridge, £100 for research in steel molding sands and their behavior under high temperature.

Cecil H. Adamson, Sheffield and Gerald S. Bell, Lincoln, £50 jointly to continue research on cast iron transverse bars and engineering formulae.

Sir Robert Hadfield referred to the President's address of the previous day and to the really serious condition of the metallurgical industries in England. The latter do not require Government help but intelligent and friendly interest would be welcomed.

Temper-Brittleness

"Temper-Brittleness of Steel: Susceptibility to Temper-Brittleness in Relation to Chemical Composition," a paper by R. H. Greaves and J. A. Jones, Research Department, Woolwich Arsenal, was then read.

Dr. W. H. Hatfield, in opening the discussion, said he was pleased to see the confession that the means adopted in manufacture for the introduction of a high impact or notch tough condition—quenching in water from the tempering temperature—leads to dangerous internal stress. In the introduction of high impact value into steel by water quenching, serious internal stresses are certainly left in steel. The authors' data must be accepted as indicating the influence of varying composition upon the ability of steel to possess, under certain conditions of treatment, either a high or a low impact value; but the speaker questioned whether the remedy is quite as simple as the authors suggest.

The real deduction from this paper is that, if 0.3 to 0.5 per cent of molybdenum be added to steel, there will be produced a steel of which the impact value will not vary under different rates of cooling. There is a lot of truth in that, but molybdenum does not invariably have that action; furthermore, the addition of molybdenum does not induce high impact value. Many of the classes of steel to which the authors refer, to which 0.3 to 0.5 per cent of molybdenum is added, will give a maximum impact value under treatment condition of 30 to 50 ft. lb., which is not a high impact value. He agreed that, generally speaking, slow cooling does not lower that impact value to an abnormally low value, but there are exceptions.

Molybdenum is an extremely expensive material and, from an industrial point of view, a recommendation which involves a material increase in the cost of steel, incurred merely to eradicate a disability of no real industrial consequence, is not to be recommended. For exceptional purposes, where very high tensile strength with considerable ductility is required, the expenditure of considerable money on molybdenum content is well justified. He did not say that with reference to the impact test, but with reference to this fact: that if one were producing a high-tensile alloy steel in which a great tensile strength is required, i.e., in which the steel in its final condition only is in an exceptionally hard condition, then the influence of molybdenum is to increase the ductility for a given tonnage, using the word "ductility" in the sense in which it usually is understood, namely, elongation and reduction of area. Molybdenum has a real influence in that respect.

*See pages 1489 to 1494 of THE IRON AGE, May 21, for account of the first day's proceedings and discussion of the papers then presented.

R. H. Greaves, in reply, said there is no doubt that internal stresses are produced by water-quenching; that was indicated in the paper, because it has been pointed out that there is a comparatively low elastic limit in quenched material as compared with slowly cooled material. The extent of the internal stresses depends to a great extent on the material being treated; in forging a uniform cross-section he thought them not serious, though in some forms of forging they are considerable.

The paper refers to molybdenum steel only with reference to the influence of molybdenum on temper-brittleness; it does not say that molybdenum steels are very fine steels. It is, of course, necessary to choose the composition just as carefully, as Dr. Hatfield pointed out, as to choose the treatment of any other steel; but the speaker's experience was definite, that in every case he had tried, molybdenum had had this effect of practically eliminating temper-brittleness.

Peeling in Malleable Iron

The following paper was read: "Peeling in White-Heart Malleable Iron," by Douglas H. Ingall, M.Sc., County Technical College, Wednesbury, and H. Field, Willenhall, and was discussed, in part, as follows:

Prof. Thomas Turner believed the authors correct in stating that the rate of heating to the annealing temper has a great influence on peeling. That is so, even with cast iron of the most suitable composition. Even with cast iron of which the sulphur content is only 0.3 per cent, if the temperature is raised too rapidly, and particularly if the temperature, after being raised rapidly, is a little too high, there will be the characteristic appearance of peeling. It is comparatively simple if one starts with pure materials and knows the rate and time of the annealing, with a given packing of oxide; but commercially one has, of course, to deal with impure materials, and particularly in England with cast iron which is very rich in sulphur.

Comparison of British and American Irons

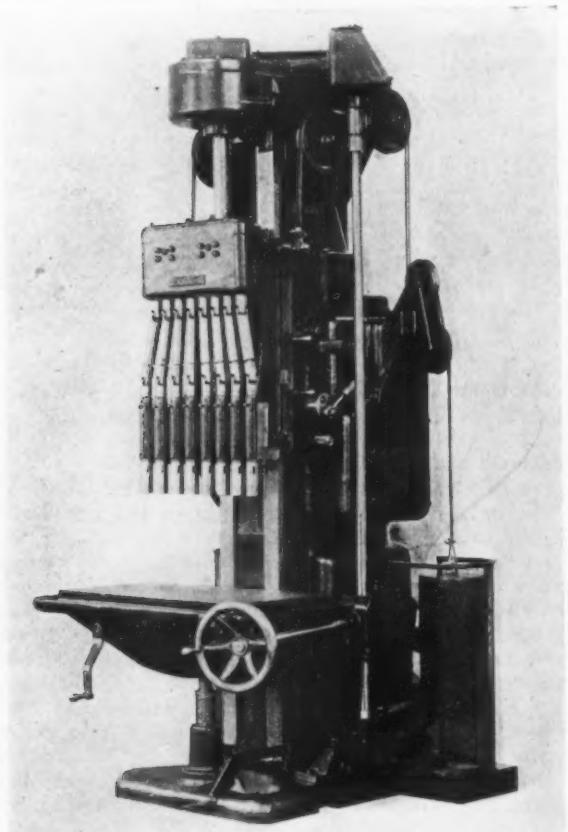
He did not know why, in England, iron should be employed containing about 0.33 per cent of sulphur, unless because it is the only iron on the market. It is presumably white iron made in the blast furnace, that is said to be refined in some way. In America, of course, iron containing much less sulphur is used, and there is no reason why in England an iron lower in sulphur content should not be used unless there are commercial reasons. Experiments have been made as to the influence of sulphur on the mechanical properties of iron, and it has been shown that, within the ordinary limits, the mechanical properties do not appear to suffer. That is, no doubt, why malleable iron founders are still content to accept iron with a high sulphur content.

They are introducing another variable and another possibility of error. The question as to what happens to the sulphur and what is the effect of the sulphur is interesting. A number of years before, the speaker showed that the presence of silicon in cast iron diminishes the solubility of iron sulphide and tends to throw it out of solution. That discovery was in accordance with the suggestion of the authors that, when the silicon is high, the greater will be the liability to peel. Sulphur and iron form the eutectic. If one calls iron 1500, iron sulphide 1170, he would get the eutectic at

(Continued on page 1609)

Drilling Machines with Adjustable Multiple Spindles

Designed to meet the requirements of a production machine for multiple drilling operations, the Defiance Machine Works, Defiance, Ohio, has brought out an adjustable multiple spindle drilling machine with straight line adjustable spindles. It will also be supplied with staggered spindles. It is designated as the company's No. 10 machine. There are eight spindles and these are fitted with S K F ball thrust bearings. The head is counterweighted and can be operated by either power or hand feed. The table regularly furnished is of the knee type and is adjustable vertically. A box type table with planed top and T slots can be



The Multiple Spindles of the New Defiance Machine Are Adjustable with 2-In. Minimum Center Distances Between Spindles

substituted. The feed and spindle mechanism which is of unit construction is lubricated by forced feed, gravity flow and splash oiling system.

The principal specifications of the machine are as follows: Minimum distance center to center of spindles, 2 in.; maximum distance center to center of spindles, 22 in.; vertical adjustment of collet in spindle, $\frac{3}{4}$ in.; maximum distance nose of spindle to base, 44 in.; minimum distance nose of spindle to base, 30 in.; maximum distance nose of spindle to table, 32 in.; vertical travel of spindle head, 14 in.; vertical adjustment of table, 12 in.; working surface of table, 20 x 36 in.; spindle speeds, six, from 110 to 344 r.p.m.; speed of drive pulley, 400 r.p.m.

The machine is driven by variable speed motor with a speed range of from 500 to 1500 r.p.m. A 7½-hp. motor is recommended for a speed of about 1150 r.p.m. It occupies a floor space of 57 x 84 in. and its net weight is 8315 lb.

Exports of iron and steel from Sweden to the United States in April were valued at \$518,000, as against \$456,000 in March, according to a cable received by the Department of Commerce.

Good American Machine Tool Business in Great Britain

WASHINGTON, May 26.—An important feature of the machine tool situation in Great Britain at the end of the first quarter of 1925 was the extent to which the sales of American machine tools continued even when the sale of other makes declined, Acting Commercial Attaché Hugh D. Butler, London, reports to the Department of Commerce. Sales of British and foreign machine tools were between 10 and 20 per cent less than in the last quarter of 1924, while American metal working machinery sold at about the same value as in the previous period. There is, therefore, a return to the situation in pre-war years, when American tools held a more important place in the British market than they have since the war.

International Harvester Co. Declared Not a Monopoly

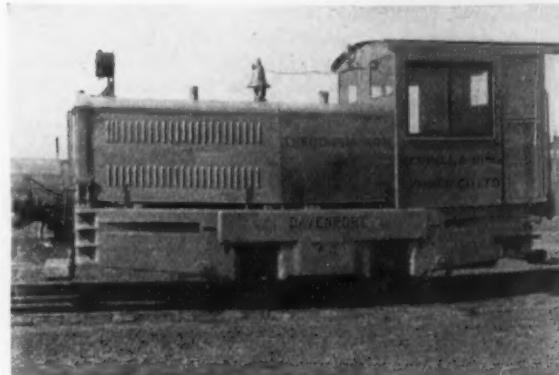
In the ruling of the United States Circuit Court of Appeals at St. Paul on May 19, it was declared that the International Harvester Co. is not a combination in restraint of trade. The decision by Judge Walter Sanborn reads, "In our opinion it conclusively proves that competition in the manufacture of farm implements is free and untrammeled."

The evidence indicated that the corporation manufactures less than two-thirds of the total implements, compared with 85 per cent a few years ago. This case has been in the courts since 1912. One other judge agreed, and another dissented, maintaining that the International Harvester Co. holds big advantages and dictates prices.

New 20-Ton Gasoline Locomotive

The new 20-ton model gasoline locomotive designed by the Davenport Locomotive Works, Davenport, Iowa, having a long, slightly tapering hood and all steel cab resting on a rugged underframe, has an appearance which suggests no "hang overs" from steam locomotive design. Working parts are inclosed and protected from dirt and weather and the arrangement permits convenient inspection and adjustment.

Roller chain transmission has been adopted as a means of reducing friction and wear and giving high



Roller Chain Transmission Is Used and the Four Wheels Are Individually Driven

mechanical efficiency, providing as well, it is claimed, a semi-elastic driving medium that protects the entire mechanism from shock. The four driving wheels have steel tires and are individually driven. Each wheel is mounted on a short axle and runs in Timken roller bearings, which take the side thrust and weight of the locomotive. The individual wheel drive is stressed as providing good tracking qualities.

The machine is equipped with a self-starter, Westinghouse air brakes, and an electric lighting system for the headlight and cab. A six-cylinder Climax engine is used. Accessibility of all parts is a feature.

How Germans Can Learn From Us*

Foundries of Two Countries Compared by a German Professor—Production Figures of the United States Declared Astonishing

TAKING as his subject "American and German Foundry Practice," Prof. U. Lohse of Hamburg, Germany, speaking at the special meeting of the Association of German Foundrymen on March 1,† stated that his remarks were based on his own observations made at about 20 American foundries which he had the privilege of visiting in the United States the previous summer.

Large Output Striking

"The most striking fact noted," began the professor, "was that the production figures of foundries in the United States are astonishingly large and that foundry practice there, from the point of view of production methods, is years ahead of ours. It therefore seems necessary to indicate the causes which have led to the American advances in foundry practice and to consider what steps are necessary to arrive at a similar state of affairs in Germany.

"The history of technology shows that at all times technical advances have been achieved through the combined efforts of several nations. The cooperation of the science and skill of the civilized nations of the world had progressed greatly before the War, but unfortunately was destroyed by the War. Recently, however, economic pressure has been compelling the nations to work again in harmony to advance technology. One of the first countries to reenter into technical-economic relationships with us has been the United States. As an example of mutual work of Germany and America in foundry equipment progress, we may mention the development of the sand-blasting equipment and vibratory sand mold production machinery.

"Considering the conversion of foundry operations to be a mechanical basis, this is obviously uneconomical where the castings vary greatly in size, shape and weight. But we also have in Germany today special foundries in which the prerequisites for machine work exist, for instance, in the manufacture of bath tubs and other sanitary equipment, sewing machines, heating equipment, automobile motors and accessories, agricultural machinery, etc. By conversion to 'machine' operation the author refers not only to the elimination of hand labor but to all attempts to increase the output of the worker with the least expenditure of physical energy by him and which make possible the use of unskilled labor in the greatest possible degree. In this classification it is quite possible to place a number of the above-mentioned machines and equipment manufactured in our foundries and to increase their profitableness.

Mechanical Equipment

"I shall now mention several fields, the proper equipment of which with mechanical foundry equipment seems to be economically of the utmost importance. Thus for the transportation of raw materials and fabricated products the use of tractors in place of fixed track systems is to be recommended. The Ford gasoline tractor may be mentioned which operates very economically; simpler still in practice are electrical tractors with storage battery propulsion. For lifting purposes the compressed air hoisting gear has been found very satisfactory in America. It should receive more attention from us as it simplifies molding work very much."

The author then described a new American installation for the tapping of cupola furnaces, as well as an arrangement for the feeding in and removal of sand.

*Translated and abstracted by Albert P. Sacha, technical director, Universal Trade Press Syndicate, New York.

†Held in connection with the Leipzig Technical Fair which included this year for the first time a separate exhibition for foundry work.

"The proper preparation of the sand is of the most striking importance in the production of perfect castings. We have satisfactory automatic sand molding machinery of German manufacture, but they are of a stationary type. The Americans most often prefer to prepare the sand where it is to be used in order to avoid subsequent transportation." The so-called sand-cutters, used for this purpose, were described. They have been used for some time successfully in German foundries.

"In preparing forms in America, wooden form molds are used for hand form building on account of their light weight and cheapness. In order to combine the advantages of the vibratory mold formers with that of the press, the higher models consist of a vibratory molding machine combined with a press. Recently German manufacturers of form machinery have also gone over to the combination of vibratory molding machines with tamping presses. The prejudices which we have here against the use of compressed air in form machines are not shared in the United States. In the case of the vibratory molding machines, we have nothing to learn from the Americans as the German machines are at least as good as the American.

"Recently, a sand compression machine has found favor in Germany which had previously given complete satisfaction to the foundries in America in the four years it has been on the market. This is the centrifugal sand molding machine in which it is possible by slower or more rapid rotation of the centrifugal arm above the form-mold to make the form denser or more porous. Subsequent tamping is not necessary. (The various types of this centrifugal machine are listed.) In Germany the stationary installation is advisable only if automatic sand feeding can be supplied and if continuous manufacture of a given shape is assured. The movable type is without reservation suitable for German conditions. Thus also under German conditions, under certain circumstances, transportation by tractor within the plant is to be considered. Locomotive transport does not at present enter into the question in German foundries."

The Ford Iron Foundry

"The production which can be obtained with centrifugal molding equipment can be visualized by an example from the Ford foundry at River Rouge near Detroit. The patterns for the motor block forms are mounted on mandrels which are placed in groups of four on a turntable. They are then turned one after the other into the range of the centrifugal head. There are 14 of these machines with which upper and lower mold forms are pressed in equal numbers for the motor cylinder blocks. In combination with the four hand mandrels each centrifugal molding machine produces 1500 complete forms in an 8-hr. shift. The advantages of the sand centrifugal machine are that they require no special foundation and are not limited to a given shaft size. All their parts are easily reached and exchangeable and they make possible, in any desired position of the form, a greater or smaller compression of the sand in the shortest time."

In conclusion, the author takes up the finishing installations. "In most American foundries," he stated, "finishing is carried out by means of tumbling barrels; especially striking is the good dust removal in the finishing departments.

"In any case the foundries in the United States have attempted very successfully, by carefully designing the planning of operations, to increase their output and to lower costs. It must be our goal to make our foundries

(Concluded on page 1611)

Iron and Steel Exports Holding Up

April Equals March at 50 Per Cent Above February
—Imports Less—Rolled and Finished Imports
One-Sixth as Great as Exports

WASHINGTON, May 25.—Exports of iron and steel in April of the present year amounted to 155,426 gross tons, as against 154,178 tons in March. The April figures, however, include two small items, metal lath and "other manufactures of wire," which are grouped under "all other" in THE IRON AGE this week, but which previously were not carried. Imports in April totaled 71,249 tons, of which 33,299 tons consisted of pig iron.

The largest item of export in April comprised boiler tubes, welded pipe and fittings, 27,077 tons, while tin plate ranked second with a total of 14,389 tons.

Exports for the first four months of this year, including some of the smaller items not previously carried

by THE IRON AGE, were 554,828 tons, or 117,711 tons less than exports for the corresponding period last

Sources of Imports of Iron and Steel into the United States in April, 1925

(In Gross Tons)

Belgium	16,269	Canada	3,323
France	6,780	Mexico	1,135
Germany	8,195	India and Ceylon	14,562
Netherlands	4,339	Other countries	368
Norway	1,591		
Sweden	2,276	Total	71,249
United Kingdom	12,411		

Exports of Iron and Steel from the United States

(In Gross Tons)

	April		Ten Months Ended April	
	1925	1924	1925	1924
Pig iron	1,632	4,117	24,740	34,222
Ferromanganese	3	1,028	3,180	3,115
Ferrosilicon	...	156	...	1,022
Scrap	6,101	11,895	41,947	83,974
Pig iron, ferroalloys and scrap	7,736	17,196	69,867	122,833
Ingots, blooms, billets, sheet bar, skelp	5,840	6,719	77,718	69,184
Wire rods	1,991	1,556	15,106	34,487
Semi-finished steel	7,831	8,275	92,824	103,671
Iron bars	454	413	3,510	5,602
Steel bars	9,427	10,720	80,452	112,918
Alloy steel bars	194	425	2,607	2,693
Plates, iron and steel	11,728	10,648	66,723	83,181
Sheets, galvanized	12,093	5,998	125,180	78,881
Sheets, black steel	7,793	5,482	91,982	152,939
Sheets, black iron	639	818	9,446	9,482
Hoops, bands, strip steel	3,259	3,243	27,072	31,915
Tin plate, terne plate, etc.	14,389	5,924	118,941	138,311
Structural shapes, plain material	8,853	7,359	85,008	84,754
Structural material, fabricated	6,929	4,170	57,366	69,373
Steel rails	11,693	7,789	148,313	225,402
Rail fastenings, switches, frogs, etc.	3,693	1,659	25,183	35,167
Boiler tubes, welded pipe and fittings	27,077	22,002	164,038	184,582
Plain wire	3,016	2,591	25,057	61,253
Barbed wire and woven wire fencing	7,073	7,426	73,194	59,556
Wire cloth and screening	...	245	1,005	1,877
Wire rope	...	321	3,361	3,903
Wire nails	735	878	8,300	44,701
All other nails and tacks	842	817	7,303	6,702
Horseshoes	35	58	648	812
Bolts, nuts, rivets and washers, except track	1,714	1,455	14,677	14,800
Rolled and finished steel	131,636	100,441	1,139,366	1,408,804
Cast iron pipe and fittings	2,657	2,453	23,918	24,244
Car wheels and axles	2,748	1,543	19,062	37,332
Iron castings	727	682	7,130	8,115
Steel castings	377	534	4,272	4,945
Forgings	212	152	1,623	1,993
Castings and forgings	6,721	5,364	56,005	56,629
All other	1,502	...	1,502	...
Total	155,426	131,276	1,359,565	1,691,437

*Beginning with April, 1925.

†Not included in the tonnage report.

Exports of Iron and Steel in Gross Tons

	All Iron and Steel	Pig Iron	Semi-Finished Material
*Average, 1912 to 1914	2,406,218	221,582	145,720
*Average, 1915 to 1918	5,295,333	438,462	1,468,020
Calendar year 1919	4,239,837	309,682	258,907
Fiscal year 1920	4,212,732	248,126	258,766
Calendar year 1920	4,961,851	217,958	216,873
Fiscal year 1921	4,168,619	129,541	82,549
Calendar year 1921	2,213,042	28,305	10,363
Fiscal year 1922	1,721,418	28,330	63,127
Calendar year 1922	1,986,297	30,922	107,201
Fiscal year 1923	1,816,329	31,891	137,757
Calendar year 1923	1,992,595	32,318	152,748
January, 1924	247,942	3,812	8,594
February	164,820	4,773	11,463
March	123,618	4,047	2,278
April	131,276	4,117	8,275
May	154,136	4,317	4,895
June	163,770	2,057	11,178
Fiscal year 1924	2,009,343	40,596	119,744
July	137,481	1,796	10,363
August	134,628	4,365	6,127
September	135,979	4,799	15,473
October	157,071	3,373	15,569
November	123,577	1,478	8,649
December	128,865	2,549	7,081
Calendar year 1924	1,792,421	41,478	114,417
January, 1925	140,802	1,298	5,764
February	101,665	1,413	5,516
March	154,178	2,037	7,951
April	154,426	1,632	6,831
Ten months	1,358,565	24,740	91,824

*Calendar years.

Imports of Iron and Steel into the United States

(In Gross Tons)

	April	1925	1924
Pig iron	33,299	17,171	268,282
*Ferromanganese	7,228	6,066	57,375
Ferrosilicon	471	1,305	6,936
Scrap	2,870	6,900	73,426
Pig iron, ferroalloys and scrap	43,868	31,442	406,019
Steel ingots, blooms, billets, slabs and steel bars	4,138	3,527	30,558
Wire rods	732	882	4,564
Semi-finished steel	4,870	(a) 4,409	(a) 35,122
Rails and splice bars	2,671	4,620	36,877
Structural shapes	8,313	2,002	48,418
Boiler and other plates	5	777	2,893
Sheets and saw plates	293	250	2,928
Steel bars	4,808	14,222	...
Bar iron	790	179	5,453
Tubular products (b)	4,424	6,375	36,609
Nails and screws	8	12	431
Tin plate	34	546	293
Boots, nuts, rivets and washers	4	109	134
Round iron and steel wire	229	196	2,220
Flat wire and strip steel	224	329	1,565
Wire rope and insulated wire, all kinds	482	96	5,862
Rolled and finished steel	22,286	14,914	155,727
Castings and forgings	235	204	2,058
Total	71,249	50,969	598,926
Manganese ore*	14,941	29,729	156,198
Iron ore	166,190	149,815	1,856,156
Magnesite	9,715	8,204	51,862

*Manganese content only, except shipments from Cuba, which are duty free and are reported in gross tons. Manganese ore from Cuba in April, 1925, was 248 tons; in the current ten months, 12,449 tons.

†Beginning Jan. 1, 1925, steel bars are reported separately from the semi-finished products.

(a) Considerable quantities of steel bars included.

(b) Considerable quantities of cast iron pipe and fittings included.

Imports of Iron and Steel in Gross Tons
(By Months and Monthly Averages)

	Total Imports	Pig Iron	Ferro- alloys	Manga- nese Ore and Oxide*
January, 1924	26,675	10,587	3,038	23,081
February	42,269	15,482	4,847	4,430
March	39,278	16,919	3,941	46,067
April	50,969	17,171	7,371	29,729
May	66,801	25,220	5,501	31,993
June	60,569	28,697	2,347	24,226
July	30,410	13,511	1,435	12,287
August	44,928	16,189	1,120	16,160
September	45,214	16,347	3,578	6,269
October	40,873	10,963	8,608	12,088
November	35,707	9,880	7,596	19,919
December	69,281	28,143	10,530	28,305
Twelve months' average	46,370	17,426	4,992	21,672
January, 1925	77,058	41,344	7,165	15,498
February	92,372	47,803	10,997	9,666
March	92,106	50,803	5,691	24,330
April	71,249	33,299	7,699	14,941
Ten months' average	59,893	26,828	6,431	15,620

*Not included in "total imports." Since Sept. 21, 1923, these figures are for manganese contents of the ore.

year. For the ten months ended with April of this year exports aggregated 1,359,565 tons, as against 1,691,437 tons for the corresponding period of last year.

India again was the principal source of pig iron imports, shipments from that country in April amounting to 14,557 tons, while Germany was second with 7221 tons. Imports of pig iron from other countries included: Netherlands, 3781 tons; Belgium, 1065 tons; United Kingdom, 3555 tons; Canada, 420 tons, and Kwangtung, 20 tons.

Of the imports, amounting to 71,249 tons in April, 43,868 tons consisted of pig iron, ferromanganese, ferrosilicon and scrap, while raw or semi-finished steel comprised much of the remainder. For the first four months of the present year imports totaled 336,804 tons, or almost twice the quantity for the corresponding period of last year, with a total of 159,208 tons. Imports of iron ore in April amounted to 166,190 tons, while manganese ore of a manganese content of 14,941 tons was imported that month, coming chiefly from Russia, Spain, Brazil and British West Africa.

Europe Needs Our Machine Tools

Worcester Manufacturer Sees a Coming Demand for Designs with Which Builders Abroad Cannot Compete—Foreign Machines Much Improved

W. LA COSTE NEILSON, vice-president and general sales manager of the Norton Co., Worcester, Mass., manufacturer of abrasive wheels and grinding machines, has just returned from a three months' tour of Europe, convinced that after a number of exceedingly poor years European users of machine tools have entered upon a period of buying for quality rather than for price. Therefore, he believes, the market for American machine tools abroad has opened again after some years of practically no business, with a prospect of continued and probably increasing activity.

Mr. Neilson's observations taught him that the new buying will be different from that of pre-war days, in that European machine tool builders have greatly improved their product in some lines of equipment, until these machines are nearly if not quite equal in quality to American models of the same kind. On the other hand, he holds, American designers and builders have developed other classes of machine tools with which foreign builders cannot hope to compete when the basis of competition is quality and production and not price alone.

Mr. Neilson had opportunity to get a composite impression of conditions in Europe. He visited Great Britain and practically all of the important Continental countries with the exception of Russia. He made a rather long stay in Berlin, the congregating point of users of his company's products from all over eastern and central Europe. He was in touch everywhere with machinery users, dealers and builders.

How European Demand for Machinery Has Grown

"In the years 1921, 1922, 1923 and a part of 1924," he said to an IRON AGE representative, "Europe was in what we may call the first stage of machinery buying. General business was exceedingly poor, and depreciated currencies and high rates of exchange worked against American competition. What buying was done was confined to domestic tools, the only exceptions being American types which had no duplicates in European shops. Then came the second phase, in which, though general business was still dull, there was more buying of machinery, for even in times of depression equipment must be kept up to a degree.

Manufacturers were still poor, and confined their purchases chiefly to machinery from surplus stocks left from the war, to second-hand tools and to reconditioned machines, which sold for half the price of new.

"A change to the third period came during 1924. Surplus stocks had been greatly depleted, and more confidence existed in political and international affairs. Rates of exchange no longer seriously influenced buyers; they accepted the dollar value as the measure of the value of their own currency. The result was improvement in demand for high-grade American machine tools. Enterprising users again began to figure that the most expensive is the cheapest in the end."

Improvement in European Machine Tools

Mr. Neilson emphasized his opinion that European machine tool builders have made a great advance in their products since the period preceding the war. "Some types of tools are in active competition in their home territories on an even basis of quality with American machines. Of course the machinery people of the United States have also greatly improved their products in recent years, particularly in design; but the Europeans have shown more advancement because they started further behind. In some classes of machinery the United States cannot hope to compete abroad, for European builders can undersell them with good tools. But in many other classes the Europeans are still far behind the Americans, who should profit from the fact."

Mr. Neilson was asked: "What would be your selection as between European and American machinery, were you called upon to buy a complete high-grade equipment for a new European machine shop? What per cent of the machine tools would you buy from foreign builders and what per cent, at higher prices, in the United States?"

"Perhaps fifty-fifty," was his answer. "I think, off hand, that is the way it would work out in the supposition case, if I had full power to use my judgment. Before the war, under like conditions, I believe my choice would have been about 80 per cent American machine tools. That may be the measure of the improvement which the European machinery people have made since the beginning of the war."

PRESENT LOW RAW MATERIAL PRICES NOT A WHOLLY UNFAVORABLE FACTOR

Raw Materials Are Declining Faster Than Finished Goods,
Which Helps Manufacturing Profits

(1) A relatively sharp decline in the price of raw materials has considerably decreased the spread between them and finished goods. This has reduced the existing lack of adjustment in commodity prices.

(2) The rather general curtailment of production in basic industries has doubtless tended to increase overhead and fixed expenses per unit. On the other hand, payrolls have been reduced and fuel and raw materials are cheaper.

(3) Coal and coke are at bottom levels with production and stocks low.

(4) Building costs are declining, but are still high in comparison with the general price level.

(5) Zinc prices, after a considerable decline, are now more stable. Zinc production is maintained and stocks show an increasing trend, which should prevent much higher prices in the near future.

The analysis of the general business situation appears monthly, as do analyses of labor, manufacturing costs and the iron and steel situation, in rotation. Next week manufacturing costs will be forecast.

BY DR. LEWIS H. HANEY
Director, New York University Bureau of Business Research

IN March the index of raw material prices declined sharply. Semi-finished materials on the average also declined, but not so much as raw materials. Finished goods showed only a slight change and were but little below the average for the last five months.

Preliminary April data give reason to believe that the relatively large decline in raw materials has continued.

These facts, as illustrated in Fig. 1, indicate that important progress has been made toward relieving one of the great maladjustments of the present price structure. Raw materials (including ore, coke, pig iron, wool, etc.) have long been high in comparison with semi-finished and finished commodities

(general manufactured goods, not specifically iron and steel). This condition, which was particularly bad in 1922 and in the early part of this year, has been one of the most serious difficulties in the way of satisfactory earnings on the part of manufacturers of finished goods.

The ratio of semi-finished goods to raw materials is now the lowest

since last December, and the ratio of finished goods to raw materials is back to a level about the same as the average of the last year and a half.

Semi-finished, or "producers' goods" (including semi-finished steel, building materials, heavy chemicals, yarns, etc.), are now relatively low and it seems reasonable to conclude that they are

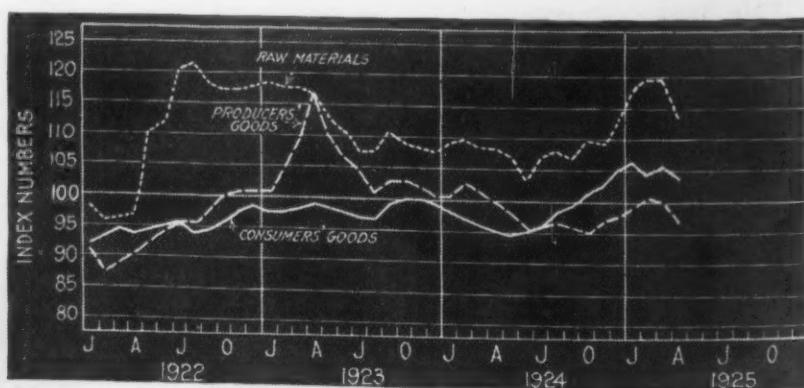
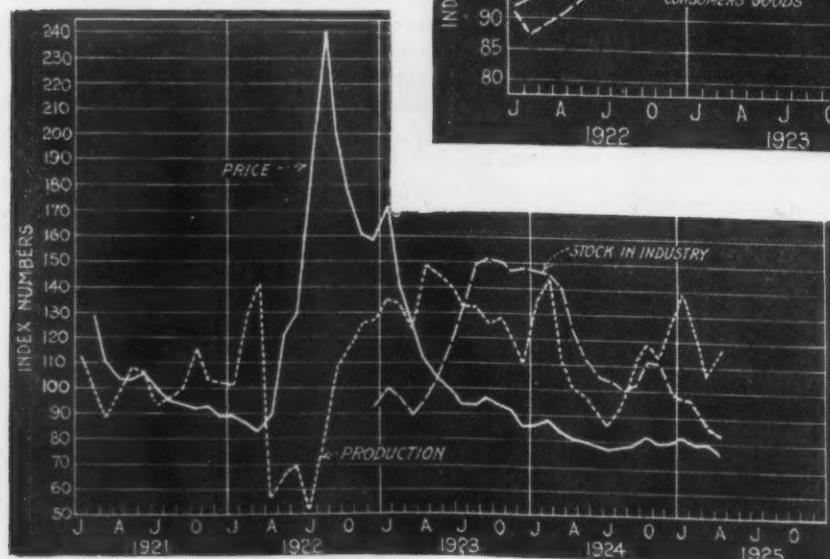


Fig. 1 (above)—The Average Price of Raw Materials Is Declining Faster Than Prices of Semi-Finished and Finished Commodities

Fig. 2 (left)—Stocks of Bituminous Coal at Lowest Point in Two Years; Prices Probably at Rock Bottom



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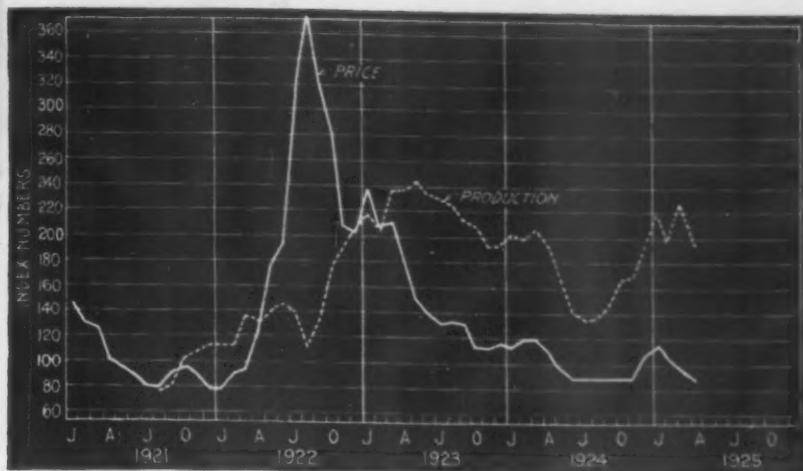


Fig. 3—Coke Production and Prices Move Downward

near bottom levels. Raw materials seem likely to go lower on the average, a step which will permit better operating margins and lower prices on finished goods.

Coal at Bottom Levels

THE production of bituminous coal, which was about 37,200,000 tons in March, fell to approximately 33,700,000 tons in April. This decrease, however, was less than usually occurs between the two months and the adjusted index number shown in Fig. 2, therefore, moved upward a little. This change in trend may be attributed to the cold weather of the past month.

It seems likely that the output of bituminous coal will be further reduced, since prices are below a profitable level in most territories and industry is still declining somewhat. The long continued dullness in the coal market is unrelieved.

Stocks of bituminous coal held by industries also declined, and at the first of May were at the lowest point reached in the last two years. This is estimated to be 37 days' supply. Ordinarily this would occasion better buying, but at the present time, with the railroad situation as favorable as it is, no immediate concern over supply has appeared.

The price of bituminous coal in April showed the lowest average in years. It is believed that coal prices are at rock bottom for the season. The *Coal Age* weekly index, after a recent advance to \$2.01 per ton, has again fallen to the bottom level of \$1.95.

In view of the existing production and stocks of coal, it is clear that any considerable industrial expansion would bring firmer coal prices.

Coke Production and Prices Move Downward

THE price of furnace coke at Connellsville is back to the low level which held from July through November, 1924 (see Fig. 3).

The total production of beehive and by-product coke has been grad-

ually declining since January and in April touched the lowest figure of the year. The decline in production, however, has as yet been very moderate, the output being maintained at about the same level as existed in the spring of 1924. By-product coke production, in fact, continues larger than a year ago. The reduction has come in beehive coke, the output of which has been sharply curtailed, and is at the lowest rate since last November.

Further declines in coke production are probable. With coke at \$3 and with production being curtailed, little, if any, lower prices are likely.

Building Costs Trend Downward

CLEARLY the general trend of building costs has been downward since the middle of 1923. The month of April showed a continued decline. In April the cost of constructing a cement factory was about 3.5 per cent less than at the 1923 peak, while the cost of a frame dwelling was approximately 5.3 per cent less.

In Fig. 4 is shown the trend of

building costs. The upper curve represents the Department of Commerce index of the cost of erecting a frame dwelling. The lower curve is the Aberthaw index based on the cost of constructing a cement factory building.

The foregoing data are of interest as bearing on the general subject of expense for additions, betterments, and repairs to buildings. They also have a broader significance in connection with the question of building supply and rents.

As the nation catches up with its long postponed building program, there should be a continuation of the tendency toward lower costs of construction and lower rent, which would constitute another step in the direction of remedying one of the great economic maladjustments which followed the war.

Zinc Stocks Slowly Increase

THE price of zinc has been declining, as forecast in this department. The average price in April was the lowest since January. The average in January was 8.14 cents per pound and in April the average was 7.44 cents per pound. Undoubtedly the average for May will be slightly lower, but it now appears that little further decline will occur this quarter. Probably prices will remain stable for a time and show some firmness.

Consumption of zinc is fair, but the production has been maintained at a level only a little lower than at the 1923 peak. There was a slight gain in the number of smelters active in April. Stocks are gradually accumulating but are still rather small, being about where they were in June and July of 1923 and lower than at any time in 1924.

The next analysis of the general business situation will appear in these pages on June 25.

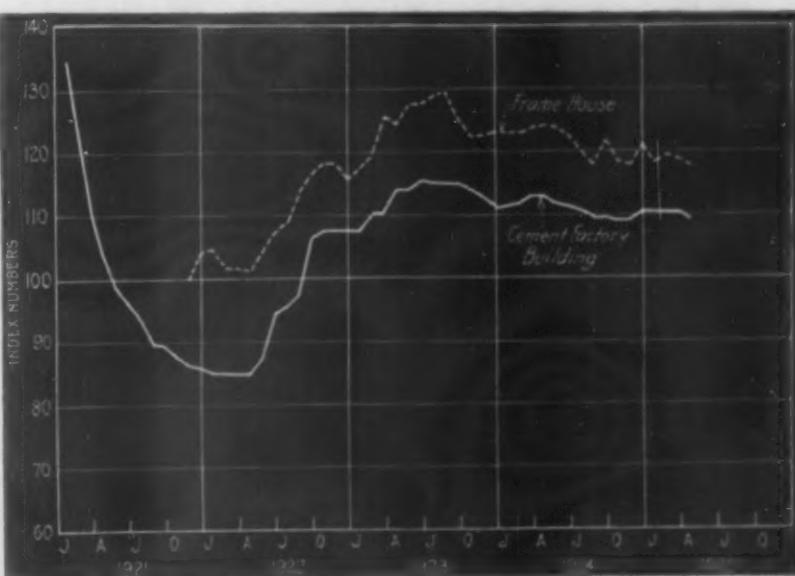


Fig. 4—Building Costs Have Declined for Nearly Two Years

ESTABLISHED 1855

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George H. Griffiths, *Secretary*

Growth in Steel Demand

AFTER the war the steel trade recognized that the industry was oversized for the consumptive demand or the consumptive possibilities. The idea became more or less fixed, and undoubtedly it would have been better for every one concerned if it had been more firmly fixed. But there is opportunity for error in judgment now in overlooking the fact that six and a half years have elapsed, in which time steel demand has had opportunity to grow.

That consumption of steel has been destined to grow and is now destined to grow will be admitted everywhere. There are many favorable influences, and none adverse. There are among other things the growth in population, the increase in investment capital and physical wealth per capita, improvements in methods of utilization whereby it costs less in time and effort to adapt the mill product to actual service, and the development of new uses.

The early idea, formed before the war ended, was that the war itself would stimulate the peace time demand thereafter, largely by requirements having accumulated. It did not take very long for that idea to be exploded; but the other idea, that the war left a complete blank or caused an actual recession, was also wrong. Each one of the four influences mentioned above as increasing the requirements for steel was in force during the war and has since been in force. That actual demand has not been expressed in purchases does not show that the requirements have not been created, or at least that the substantial and necessary foundation for them has not been laid.

In the long up and down swings that characterized steel buying before the war it used to be said that "demand grows while it sleeps." Each time it was expressed it caused production far in excess of the previous record. We do not know that the same process has not been going on during and since the war to a far greater extent than has been exhibited in actual buying.

Without counting upon such an influence, however, the effect of the lapse of time in adjusting demand to capacity may be overlooked. There was a large growth in steel-making capacity during

the war, but there has been very little since. It is sufficiently accurate for the purpose to take it that steel ingot capacity was 35,000,000 tons at the beginning of the war and 51,500,000 tons on Jan. 1, 1919, and that it has lately been 54,000,000 tons. There is an insignificant increase in six years.

Computations may be made to suggest in a quantitative way how influences may work out. For an idea of the old pace of growth three years of particularly high production of ingots may be taken: 1899, 10,458,745 tons; 1906, 22,624,431 tons; 1912, 31,251,303 tons. From 1899 to 1906 the average annual increment was 11.7 per cent; from 1906 to 1912 it was 5.5 per cent. It is recognized of course that since steel was once a new thing it cannot grow in percentage now as it did in its early years.

However, only an insignificant growth of 3 per cent year by year from the 1912 production would make 47,300,000 tons for next year. That is 8 per cent in excess of any tonnage yet made.

For another quantitative illustration, grant for argument that the capacity Jan. 1, 1919, was 50 per cent in excess of the natural and normal requirements at that time. Then, at the 5.5 per cent annual rate of gain shown from 1906 to 1912 it would take just eight years, or to Jan. 1, 1927, for it to grow up a 54,000,000-ton level. In each case a very conservative basis is taken. A much stronger argument could with reason be pressed.

Smaller Labor Turnover

"EVERY industrial problem," said Frederick W. Taylor, "involves the human equation." Which is to say that the question of manufacturing cost always gets back to the man on the job. A good workman costs less than a slacker. Consequently, any improvement in methods of dealing with men is as surely reflected in the auditor's report as a betterment in the method of handling machines or material.

Weighed in the balance of "manufacturing cost," the elimination of the twelve-hour day can hardly be rated among the unadulterated improvements. Judged by other standards it has merits which are not related to practical economy, but there can be

no doubt as to the increase in manufacturing cost which it has entailed.

Yet, while the three-shift system may be an ill wind from the cost standpoint, it has blown some good. Already there are definite indications that a higher grade of employee is attracted to the iron and steel mills under the new regime; that it is easier to hold the better grade of workman, and that the cost of hiring and firing has been reduced.

In 1922 the labor turnover at the Bethlehem Steel Co. was just over 100 per cent. In 1923 it advanced to 135 per cent. Last year the turnover dropped to 63.3 per cent—the first time it has ever reached so low a figure. Thus far this year, although there has been some increase due to a slightly higher rate of operation, the turnover has been about 70 per cent on a yearly basis.

It costs money to hire men. It is expensive to break them in, even on the most ordinary jobs. High turnover means waste. And if the working out of the three-shift system continues to cut down labor turnover as compared with the old two-shift method, then the cloud of increased cost which has hung over the industry will be found to have its silver lining after all.

Economics and Sociology

ONE of the results of economic progress is a departure from some of the old principles, and recognition of this fact is essential to a correct appraisal of present conditions and prospects.

An important change is in men's choice of occupations. The early economists took it for granted, and no doubt rightly, that rate of pay determined men's choice, that a man would naturally and invariably choose the most remunerative occupation for which he was fitted, when opportunity for choice was presented.

The talk for years about the preference of so many men for "white collar jobs" is sufficient to show that there has been a great change; but there are many changes. President Roosevelt's farm life commission attacked another phase of the matter. The idea was that farm life could be and ought to be made more agreeable; that at the time there were not so many farmers as there would be on the mere basis of the pecuniary reward in proportion to the amount of work done.

Sociology tries to throw light on some of these questions, for they cannot be answered on economic grounds alone. Other considerations must be taken into account. Men will not be guided in their choice of occupation purely by money return; hence the cost of doing each kind of work, of producing each class of goods, will not bear the same relation to the general value of the dollar that it used to bear.

A keen observer wisely says that Americans simply do not know what to do with their leisure time, that they work hard to get money and leisure and then do not know what to do with them. Americans have become quite particular about their occupations, and perhaps here is the reason. If they enjoyed their play more they might be less particular about their work; the avocation might make up for discomfort in the vocation.

By combining economic and sociological study it may be found possible to explain some things in

the course of prices of various classes of commodities that remain mysterious. The Bureau of Labor's first commodity price comparisons were based on the average prices ruling in the ten years 1890 to 1899 inclusive. By 1913 the index numbers for different classes were far apart. Afterward the bureau adopted 1913 prices as 100, thus assuming the price relations existing in that year to be normal or standard. Now the classes have grown apart the second time, and in several instances the divergences are in the same direction as those seen in 1913. Thus if the present statistics were based on 1890-99, still greater divergences would be seen in some classes. Of course important changes have occurred through some industries introducing greater economies, growing more in efficiency, than others. Such influences can be traced and identified. The sociological influence is also there. It is more recondite but it needs to be studied.

Testing Large Steel Castings

A TEST that will show how good a thing is, without destroying it during the test, has been the ideal of inspectors from the beginning. Many articles of commerce may be closely inspected by visual and rule-of-thumb means. Highly skilled men are able to determine the quality of fabrics or of edibles by their appearance. Like the connoisseur of art, they observe without effort a thousand minute differences, and their general interrelation. If any factor varies a little from type, the difference is enough to mark it for second or third grades.

But metal, wood, stone, and other materials of construction are not so easily passed. No one has appeared who can see very far below the surface of metal. Yet it is obviously necessary for the engineer to *know* how good is the metal he puts into important structures or machines, where human safety depends upon the reliability and uniformity of the raw materials. Hence the whole art of testing materials.

At the present time this art implies one or two things that are not always easy to guarantee. In the first place, the small sample examined must be representative of the whole mass of material. This implies, of course, either that the whole production must be uniform (a condition which every one knows is impossible of attainment) or that the sample represents the lowest quality which is to be encountered in that particular lot.

Thus the difficult art of testing is closely allied to the more difficult art of sampling. Put together, there are so many chances of error that the cautious engineer has often wished for some method that could really test the entire mass and indicate the weak spots.

Magnetic and electrical tests have been studied carefully, and have been successful in a certain field. Wire rope, cables and chain may now be inspected with considerable precision by these means. Steel rails also, have been studied, but up to the present it has been impossible to correlate the electrical indications with recognizable defects in the internal structure. Despite the fact that the field is relatively limited, the magnetic and electrical tests for

uniformity certainly represent long steps toward the ideal of a non-destructive test for quality. It may be pointed out that such a test need not be universal—several different kinds will ultimately be necessary to cover the entire field of metals.

Another notable advance in the art is application of X-ray shadowgraphs to the examination of steel castings. A historical study would probably show that materials of construction were X-rayed almost as soon as a piece of flesh and blood. However, the medical and surgical applications became very common before rays strong enough to penetrate thin pieces of metal were produced. Only this fact has prevented more rapid use of the X-ray for metallurgical diagnoses.

However, a few investigators kept at the problem. Larger and larger Coolidge tubes were produced. Longer and longer exposures were tried. The hazy photographic plates were studied and specimens cut apart to find out what internal structures caused each peculiar marking. Finally it has become possible to examine steel up to 4 inches thick, and to pick out cavities or inclusions no larger than 2 per cent of the thickness. That means that a blowhole $1/10$ inch in diameter could be discovered in a 4-in. wall of a heavy steel casting!

It ought not to be necessary to do more than

point out the great advantage of such a test to the steel foundryman. Before standardizing on the molding practice on any quantity production, sample castings could be studied for blowholes, shrinkage, cavities or cracks. All of these could be corrected by changes in the molds, and the casting put into production with great confidence of uniformly satisfactory results. This has been done at Watertown Arsenal with good success. Or, single important castings may be studied and put into service only if they proved to be of good quality. A notable instance of this is the work for the new Weymouth steam plant, built by the Boston Edison Co. Turbine casings, valve bodies, expansion nozzles—in fact, all steel castings operating at 1200 pounds steam pressure—were X-rayed carefully wherever stresses approached a factor of safety of 8. Nearly all the castings proved to be of most excellent quality. A few were remade in molds of different design (as indicated by the X-ray work), while in one or two instances a gas pocket was so located that the metal was machined off to below the defect, the casting bushed and the bushing welded in place.

This beginning is auspicious indeed. We look for a wide use of this test, so important both to the manufacturer and user of large steel castings built to carry heavy stress.

CORRESPONDENCE

American Fluorspar Industry Threatened

To the Editor: An appeal has been made by a number of Kentucky miners of fluorspar to the Interstate Commerce Commission for relief from conditions which they declare are becoming intolerable. The importations of foreign spar into the United States, according to the figures given out by the Department of Commerce, are as follows:

1921.....	5,562 tons
1922.....	29,551 tons
1923.....	37,396 tons
1924.....	45,574 tons

During the first quarter of this year the importations were as follows:

1925	
January	5,624 tons
February	3,090 tons
March	5,119 tons

Total 13,833 tons

Thus in the first quarter of this year nearly three times as much spar was imported as was imported in the year 1921. Should importations of spar continue at the present rate the total this year will exceed 55,000 tons.

Most of the spar being imported is coming from Germany. The contention of the American producers of fluorspar as put before the Tariff Commission is that this spar is being laid down in Pittsburgh and even further west at prices below the cost of production under American conditions. The claim is made that the spar is being produced by foreign workmen, paid at low rates of wages, and is being brought across the Atlantic practically at ballast rates of freight, whereas the American producers are obliged to pay American wages and are obliged to pay railroad freight rates which are from two to three times higher than the freight rates which prevailed in 1914.

The Kentucky miners of fluorspar, in laying their case before the Tariff Commission, state that their industry is imperiled; that most of the spar mines are already shut down; that the millions of dollars invested in the industry are in jeopardy. Also as a corollary, of course, workmen are idle.

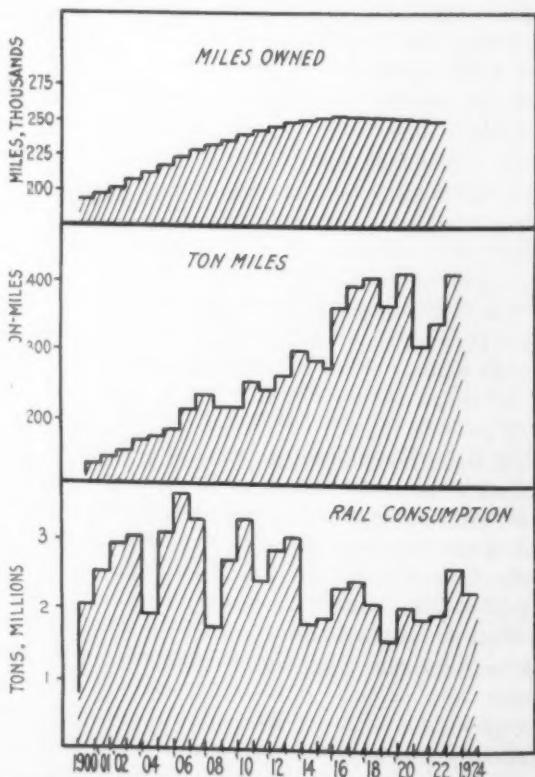
The amazing increase in the importation of foreign spar speaks for itself.

JAMES A. GREEN.

Cincinnati, May 19.

Rail Longevity and Traffic Carried

To the Editor:—No one can dispute the facts so well brought out in your editorial of May 14 on "Rail Longevity." Plainly the railroads are taking advantage of every means to prolong the life of their rails and the transition from Bessemer to open-hearth has



Railroad Mileage Has Increased 25 Per Cent, Ton Miles Handled 150 Per Cent, While Rail Consumption Has Actually Declined 25 Per Cent

been of great benefit. The replacement of main line rails with those of heavier sections and the removal to less important lines of those 80 to 90 lb., rails that formerly constituted the main tracks, is another outstanding development. But the heavy rails will wear out in time and new rail must then be obtained for their replacement.

The appended chart is an interesting commentary on the situation. It shows the number of miles owned by the railroads and the number of millions of ton-miles of revenue freight carried each year since 1900, the figures being taken from the year book of the Department of Commerce. It also shows the yearly consumption of rails in the United States, these figures being the tonnage rolled plus that imported and with that exported deducted. The trend of the mileage shows an increase of about 25 per cent in the 25 years, while also apparently the traffic carried has increased about 150 per cent. But the trend of rail consumption shows a decrease of about 25 per cent.

Can this paradoxical condition last?

C. W. GENNET, JR.,

Chicago, May 18.

Robert W. Hunt Co.

25 Tons of Pig Tin Stolen

To the Editor:—Regarding the 25 tons of pig tin which was stolen from Stetler's warehouse, 527 Washington Street, New York, on May 16 or May 17, it is a serious matter when merchandise in carload lots can be taken from a bonded public warehouse by anybody who seems to want the property.

The Peerless Tube Co. offers a reward of \$1,000 for any information that will lead to the recovery of the metal. It is well known that, in case of proof that stolen goods are sold, the buyer, no matter how long after the sale, can be held. It is, therefore, of the utmost importance that care should be used by the trade in buying tin, unless the firm from whom the purchase is made is known to be a legitimate dealer in metals.

We would appreciate it if the trade would cooperate to the limit in endeavoring to locate this metal, notifying the Peerless Tube Co., Bloomfield, N. J., or the National Surety Co., 89 Maiden Lane, New York. The New York Police Department is actively at work on the case.

It is quite a job to remelt or to change in any way 60,000 lb. of pig tin. It cannot be done in a few minutes, and the probability is that this metal will remain out of sight for weeks, or even months, and will then be offered to the trade in some other form. The marks on the tin are as follows: A M C 89 — LL — RR.

GEORGE H. NEIDLINGER,
President, Peerless Tube Co.

Bloomfield, N. J., May 25.

Officers of Golden Gate Chapter of Steel Treaters

SAN FRANCISCO, May 23.—Frank B. Drake, president Johnson Gear Co., Berkeley, Cal., was elected chairman of the Golden Gate Chapter of the American Society for Steel Treating, at the annual meeting and dinner of the society May 13 at the New Peerless Cafe, Oakland, Cal. F. H. Pelle, vice-chairman, presided at the meeting in the absence of the retiring chairman, P. L. Bannan, who was prevented from being present because of illness. E. Downing, president Hoover Spring Co., San Francisco, was elected vice-chairman, and D. Hanson Grubb, Pacific Scientific Co., San Francisco, secretary-treasurer.

The executive committee is composed of the following members: O. N. Armitage, Columbia Steel Corporation; P. L. Bannan, Pacific Gear & Tool Works; Prof. A. P. Domonske, University of California, Berkeley; E. E. Jamison, Jamison Steel Co.; C. S. Moody, C. L. Best Tractor Co.; H. S. Taylor, Holt Mfg. Co.; H. H. Ventnor, Southern Pacific Co., Sacramento; H. H. Whiting, Best Steel Castings Co.; F. L. Wight, U. S. Steel Products Co.; R. T. Wise, Standard Die & Specialty Co.

THE IRON AGE

HONOR GEORGE SMART

Service in His Memory Held at Home Church on Sunday Afternoon

A beautiful, inspiring memorial service to do honor to George Smart, one of the directing editors of THE IRON AGE, whose death occurred after a brief illness on Saturday, May 16, took place Sunday afternoon, May 24, at the Church-in-the-Gardens, in Forest Hills, Long Island, New York. Business associates, friends and neighbors filled to overflowing the artistic suburban church in which Mr. Smart had for years officiated as trustee and chief usher. The chancel was banked with flowers sent by organizations with which Mr. Smart had been connected and also by friends.

Tributes to Mr. Smart came from the various walks of life in which he engaged his time. The esteem in which he was held by his business associates and business friends and acquaintances was fittingly told by A. I. Findley, editor in chief of THE IRON AGE, who had been associated with Mr. Smart through 23 years of iron trade journalism. Mr. Findley supplemented his remarks by reading letters from several men whom Mr. Smart had inducted into trade journalism and who acknowledged the debt they owed to him for the training received under his tutelage. Prof. George Wells Knight, Ohio State University, Columbus, Ohio, who knew Mr. Smart as a student, spoke feelingly of the affection which Mr. Smart held for his alma mater. Walter L. Sheppard, Philadelphia, formerly national president of the Phi Kappa Psi fraternity, a position which Mr. Smart had also held, spoke of the interest which Mr. Smart had taken in the fraternity and particularly in the younger men.

Mr. Smart's neighbors, Edward H. Mays and Judge Charles F. Moore, Forest Hills, paid touching tribute to the work which Mr. Smart had done in his church, in the Community Council and in the Men's Club of Forest Hills and to his kindness to all with whom he came in contact. He had conducted a Sunday morning boys' class in biography at his home and one of these boys joined in telling of the debt they owed to Mr. Smart.

A musical program in which an organist and the choir participated and a prayer and benediction by the Rev. Claris Edwin Silcox, minister of the church; completed the service, which was presided over by Lyman Beecher Stowe, of Doubleday, Page & Co., a friend and neighbor of Mr. Smart.

Blast Furnace and Coke Oven Association Meets June 4

The annual spring meeting of the Eastern States Blast Furnace and Coke Oven Association, when officers for the coming year will be elected, will be held at the Youngstown Country Club, June 4. It will last all day, with the forenoon and early afternoon set aside for visits to Youngstown district steel plants, the later afternoon for golf and the evening for a dinner, which will be followed by a paper by F. W. Sperr, Jr., chief chemist, Koppers Co., Pittsburgh, whose subject will be, "The Purification of Coke Oven Gas, with Special Reference to the Preparation of Gas for Open Hearth Furnaces." The committee in charge comprises H. S. Braman, chairman, E. J. Reilly, G. T. Williams, J. S. Fraser and W. A. Haven.

An elevated tank 80 ft. in diameter, with vertical shell 35 ft. high and a curved bottom, is to be built for Charleston, S. C., by the Chicago Bridge & Iron Works. The tank will have a capacity of no less than 2,000,000 gal. and will weigh approximately 600 tons. The depth of the ellipsoidal bottom is 26 ft. 8 in., and the bottom of the tank is to be 53 ft. 6 in. above the ground. It will be supported by 24 columns on 1500 cu. yd. of concrete. The tank is to be fabricated at the company's works at Greenville, Pa.

Savings Banks Reflect Thrift but Not Necessarily Increase in National Wealth

Larger Deposits May Often Represent the Transfer of Credits from One Class of People to Another

BY PARACELSIUS

COMING down from Westchester County to New York in the club car a few days ago I sat with my friends, Quinn and Austin, and listened to their conversation. Quinn began it by throwing down his morning paper and pointing with his index finger to an editorial that he had been reading.

Quinn. I see that careful studies of statistics of savings bank deposits, of life insurance sales, the absorption of securities and the building of homes show that the American people are becoming thrifitier. Since 1920 the deposits in savings banks have been rising steadily. The present rate is 41 per cent higher than it was in 1920. That shows clearly enough that the country is growing rapidly in wealth, does it not?

Austin. No, it does not show any such thing. The mere representation of a gain of 40 per cent in four years is proof to the contrary. If maintained at the same rate for 10 years, deposits will have doubled. Not even according to the incoherent and inconsistent Census reports does the wealth of the country double in so short a time. A normal yearly rate of increase is more like 3 per cent than 10 per cent.

Q. Well, then, how do you explain it? Sometimes I think that these statisticians don't know what they're talking about.

A. The explanation is simple enough if you stop to think. You don't put wealth in the savings bank unless you deposit gold certificates. In the main, people deposit pieces of paper representing credits in their favor. The increase in savings bank deposits represents a transfer of credits from one class of people to another. I don't suppose that you yourself have made a deposit in a savings bank since you were a boy. When you grew up and went into business the first thing you did was to draw your little stake in order to use it in your business.

Q. Yes, I was getting only 4 per cent and I saw my way clear to get 10 per cent.

A. Just so, and you kept on doing that, or tried to. If you have ever had any surplus you've invested it in stocks to yield 6 per cent; or, if you've wanted to accumulate a nest egg and have it safer, you've invested in bonds at 5 per cent. But the chaps who work for wages don't know those tricks. If they're thrifitier they put their money into the savings bank.

Q. Well, that's nothing to find fault with. It's a mighty good thing, I say.

A. To be sure. I'm not deprecating it. I'm simply saying that it doesn't mean that it measures increase in the prosperity of the country.

Q. Rubbish. You're talking contrary to general belief. Some buncombe, eh?

A. The buncombe is the other way around. Let's see. You and I are earning no more than we were five years ago, and we're not saving so much.

Q. Living higher, perhaps.

A. Not on your life. I used to keep four servants. Now only two. What becomes of the difference between my gross income and my living expense? Well, first the taxgatherers take a big slice. Then upkeep of my property takes another. Here's a bill for repairing plumbing that had to be done. By Jupiter!

Those fellows ought to be able to make deposits in the savings banks, I'll say.

Q. Then they're doing the saving instead of you. Lazicus, our socialistic friend, says that's a good thing. Diffusion of wealth, you know. You ought to rejoice in seeing the rise of the working classes. They've been ground down too long, you know.

A. Well, I'm the last one in the world to want to keep them down. The bunch of mechanics who work in my town and absorb a considerable part of my earnings are a first rate lot. They're American citizens of the best type. Personally, I like them and wish them well. Some of them are thrifitier, and having billed me and collected of my money they put it in the savings bank. But others put it into gasoline. None of them works more than 44 hours a week. And they don't do so much work per hour as they used to. The way your diffusion of wealth works is that about half is lost in the process of diffusing.

Q. I don't see that it makes much difference in business.

A. No, you don't see it. The fellows who are burning up gasoline for joy-riding are making fine business for the petroleum and tire companies. In turn they make fine business for the steel and rubber and zinc companies and so on. Where we'll feel the pinch will be when we come to building new subways for New York, new sewerage for Chicago, and such things, not to speak of the exigencies of renewing and extending our industrial plant.

Q. Oh, I guess we'll postpone thinking of crossing that bridge until we come to it. There'll always be pessimists like you.

A. Do you want me to define an optimist as one who refuses to look ahead? I was noticing your own house as I passed it this morning. It seemed to me to need painting.

Q. Need painting! It's hollerin' for it. It hasn't been done for nine years. Cost \$500 then. I had it estimated four years ago. The pirate of a painter wanted \$1,500 for doing it. I couldn't afford it.

A. So you've been letting the property deteriorate! That's one way of living on principal. The Department of Agriculture says that farmers are letting that happen on an extensive scale. One of my friends who is in the paint producing business alleges that annual deterioration of property from inadequate painting in this country is something like a billion and a half dollars.

Q. You make me shiver. Guess I'll sell some stocks short this morning.

A. Oh, no, don't do that. Rather buy them for the rise. Only be sure to buy the right ones, meaning those that have to do with things for which the public likes to spend its money. We can have great activity in business when the public is buying gasoline, which means steel for pipes and tanks, just as much as if it were saving money with which to buy steel for subways. It will be many years before we become conscious of the economic difference. In the meanwhile, the only thing that counts is whether our labor is enjoying too much of the luxury of leisure, either from hours too few or taking it too easy per hour or both.

When pay is drawn out of you in that way it doesn't even make for business activity, much less economic savings and prosperity. That spells sheer waste.

Q. Well, even that may be offset by improving methods, so that less work has to be done.

A. Right you are. We're straining heaven and earth to do that very thing, so as to preserve the earning capacity of the millions that we have already put into bricks and mortar and steel in the form of plants, railroads, etc. But is the engineer's sweat to make the mechanic's holiday? The labor leaders smiling push us on, at the same time sneering at the socialists

who would steer everybody into quagmires where there would be no holidays.

Q. I'd say that there's the danger that the labor leaders might overplay their hands. They seem to have done that in the shoe manufacturing towns in Massachusetts.

A. Yes, there's that danger and a lot of others. However, we've got to run the gauntlet of them. The forces that are in motion are too great for human minds to regulate or restrain. The most that we can do is to avoid intensifying them and to remove some of the embarrassing restrictions.

BOOK REVIEWS

The Science of Metals. By Zay Jeffries and Robert S. Archer. Pages, XVII + 460, 6 in. x 9 1/4 in. Illustrations and diagrams, 189. McGraw-Hill Book Co., Inc., New York. Price, \$5.

Metallurgy deals with the production of metals from their ores and the fitting of them to industrial and other uses. The book under consideration does not consider the first part of the definition, but comes under the heading of books on physical metallurgy or metallography. It consists of 12 chapters following a short preface. There is a remarkably complete list of contents, for instance Chapter 1 of 23 pages, which is largely introductory, has its material covered in 53 headings, and Chapter 10 of 64 pages has 50 headings. In the body of the book these headings are given in bold type followed by one or more paragraphs. The list of contents, therefore, is as complete as a short index and is of help in finding material.

The first chapter is introductory and deals largely with the terms used frequently in metallurgy. It speedily turns to consideration of the atom and is, therefore, characteristic of the book, because the space lattice and atomic arrangement of metals and alloys are given great prominence throughout. There is a splendid table in this chapter covering two pages giving details of 40 of the elements of chief interest to metallurgists. This table is in c. g. s. units and gives such things as atomic volume, density, melting point, boiling point, coefficient of expansion, specific heat, thermal and electrical conductivity, shrinkage during crystallization, type of space lattice, axial ratio, size of the space lattice side and closest approach of atoms. It is an instructive and valuable chapter, clear and simple in language.

Chapter 2 deals with electrons, atoms and molecules, because it is realized that the metallurgist needs a knowledge of the ultimate particles of his materials. It is based on a simple theory of the atom and is helpful in visualizing the size of atoms.

Chapter 3 takes up the crystalline structure of metals. There is a concise but clear description of the Miller system of crystallography and the Miller indices. Metals and alloys are considered from the standpoint of the space lattice. Fig. 6 is a poor photomicrograph, far below the general excellence of the other illustrations. There is a good presentation of the methods of X-ray investigation of opaque crystals after which the arrangement of atoms in metals is taken up.

Chapter 4, of 20 pages, deals with the controversial question of the amorphous state in metals. The amorphous theory is outlined in some detail, the supporting evidence and much other material is given, and the authors are evidently believers in the theory. Like many of the chapters, this one concludes with an excellent summary.

Chapter 5, taking up grain growth and recrystallization, contains 58 pages and is probably the most important chapter in the book. The diagram on p. 87 dealing with cold-drawn and annealed copper wire

might well have been accompanied with photomicrographs, since the argument is based on microstructure. Part way through the chapter there is an excellent summary of the laws of grain growth and the chapter closes with another good summary regarding crystalline nuclei, germination, stability, etc. It is a chapter of great importance to all interested in the heat treatment of metals.

The discussion, in Chapter 6, of a temperature scale in relation to hot and cold work is very good, as also is the discussion of single crystals and the relation of hardness to grain size. The chapter contains the results of a great deal of original work, much of it unpublished before, on the properties of cold-worked metals. As a whole the chapter deals with pure metals and solid solutions, and in general is concerned chiefly with the effects of cold work.

The next four chapters cover subjects usually found in the good textbooks on metallography, the chapter headings being Compounds of Metals, Metallic Solid Solutions, Constitution of Alloys, and Structure and Properties of Aggregates. The chapter on solid solutions is particularly good. The authors should give the reference from which the quotation is taken on page 256. The chapter on the constitution of alloys has a short but clear discussion of the phase rule, takes up cooling curves and then deals with constitution diagrams of typical alloy systems. In mentioning the uses of lead-antimony alloys, page 299, it would have been well to mention battery plates and grids. Also in regard to silver-copper alloys, page 302, for a number of years the 92.5 per cent alloy has not been used for coinage in Great Britain. The play of colors, from which pearlite was originally called by Sorby "the pearly constituent," was not seen under the microscope, but by means of ordinary visual observation. Indeed, it is very seldom, if at all, that this play of colors can be seen under the microscope (page 308).

There is an excellent discussion of the theory of malleable iron production in this chapter when stable and meta-stable systems are being dealt with. Also, the peritectic reaction noted in certain alloy systems is well treated, and there is a very good discussion of the importance of solid solubilities. In the latter part of the next chapter the authors develop the theory of hardening by slip interference and discuss in detail the aging of duralumin.

Chapter 11 is a short one on hardness of metals, and brings together material given in other places in the book, concluding with a good summary. Finally comes Chapter 12, of 30 pages, on the hardening of steel, with very good discussions of the nature of the various constituents such as austenite, martensite, troostite, etc.; and also a good discussion of high-speed steel. It is interesting to note that the authors believe the great hardness of martensite to be chiefly due to the extremely fine size of the crystals of alpha iron.

The book as a whole is very clearly written. It is well printed, and the numerous illustrations and diagrams are not only well chosen, but beautifully reproduced. Also the book is remarkably free from errors, giving evidence of very careful editing and proofreading. It covers in a masterly way the field of the application of metals and alloys as a whole, and is a distinct and valuable addition to our technical literature.

G. B. WATERHOUSE.

GRAY IRON CASTINGS

Dr. Moldenke Tells Pittsburgh Foundrymen How to Improve Them

The gray iron foundry industry, at least the Pittsburgh section of it, took hope from the talk and counsel of Dr. Richard Moldenke, who in his talk before the members of the Pittsburgh Foundrymen's Association at the General Forbes Hotel, Pittsburgh, Monday evening, May 18, not only reviewed what had happened since the termination of the war, but prescribed the remedies for the restoration of gray iron castings to the place they occupied before giving ground under the competition of steel and malleable castings.

This meeting savored of a reunion, since the principal speaker was a former president of the association and was introduced by Isaac W. Frank, chairman United Engineering & Foundry Co., Pittsburgh, one of the founders and a former president of the organization.

William K. Frank, vice-president and general manager Damascus Bronze Co., Pittsburgh, who was chosen president of the association at this meeting, is a son of Isaac W. Frank. Other officers of the association elected at this meeting and who will be inducted at the June meeting, which will be a part of the annual outing to be held at The Pines, Keown, Pa., June 22, are L. V. Stevens, Locomotive Stoker Co., Pittsburgh, vice-president; William J. Brant, secretary-treasurer and Ralph W. Jones, Union Switch & Signal Co., Swissvale, Pa.; Thomas A. Reynolds, the McConway-Torley Co., Pittsburgh; E. D. Frohman, S. Obermayer Co., Pittsburgh; James Jones, Pittsburgh Valve Foundry & Construction Co., Pittsburgh, and C. D. Carey, Verona Steel Castings Co., Verona, Pa., members of the executive committee. Dr. Carl Humperdink, a brass and iron founder at Wetzlar, Germany, and his son were present.

Difficulty with Raw Materials

Dr. Moldenke said that since the war the struggle had been a constant one for the foundryman in getting out of the materials that have been available, the high quality of finished material that was persistently demanded. The general average quality of pig iron had fallen, he said, because furnace men were pressed to get out iron at a price so low that taken with the high cost of ore, coke and labor, there was no escape from the use of scrap. This made for poorer quality pig iron, since the lime took out only the sulphur and did not disturb oxidation.

Since washing of coal had largely ceased since the war, present day beehive oven coke was running high in sulphur and in ash. He noted the increased use of by-product coke in the cupolas, but said that in using this grade, it was well that it be laid out thin so that the iron will get the heat before the coke takes fire.

Pittsburgh Screw & Bolt Co. Takes Over Continental Company

The Pittsburgh Screw & Bolt Co., Pittsburgh, has acquired and as of June 1, will assume control of the Continental Bolt & Iron Co., South Chicago, William G. Costin, chairman of the former has announced. The Continental company will be merged with Gary Screw & Bolt Co., Gary, Ind., a subsidiary of the Pittsburgh Screw & Bolt Co., and both plants will be under the direction of George Horney, manager of the Gary Screw & Bolt Co. Paul Richter, president of the Continental company will retire with the formal taking over of the company by its new owners, but no other important changes in the personnel of the plant are contemplated.

The Continental Bolt & Iron Co. is one of the largest bolt companies in the West. Its plant site comprises 10 acres in South Chicago and its acquisition will practically double the output of the Pittsburgh Screw & Bolt Co. in the West, and give the latter a combined yearly production in Pittsburgh and the Chicago district of between 180,000 and 200,000 tons.

The size of the coke was important in that if hot iron was desired, it was necessary that the coke be in large pieces, which were less likely to take fire than the small pieces before imparting heat to the iron. The speaker mentioned the difficulties that the foundries now had in securing scrap in competition with the steel makers, who were taking grades that formerly found their sole use in the foundries.

Facing Low Price Demand

Dr. Moldenke thought the investigation into sand was timely, as the Government took so much of the good sand during the war and the general run of foundries do not prepare their own sand. High labor costs are affecting everything used in the foundries and with consumers generally seeking lower prices, the gray iron foundries are hit harder than the steel or malleable foundries, especially the steel foundries, because in making steel castings oxidation is continuous and with oxygen out and ferromanganese in, good steel is made out of poor iron. The speaker also told the advantage possessed by steel foundries in the high percentages of steel scrap that could be used.

More Science Needed in Melting

In pointing the way out for the gray iron founders, Dr. Moldenke asked for greater use of the laboratories and more science in melting. The electric furnace he regarded as too costly in these days for making castings, but did think there was a chance for economy in cupolas of smaller diameter than those now commonly employed in this country and in duplexing from cupola to electric furnace.

He believed the quality of pig iron could be improved by greater use of alloys and these he would add in the blast furnace in their original state instead of as ferroalloys, mentioning the use across the water of briquettes of silicon running as high as 95 per cent. Greater care with melting cuts the variation in temperature of the iron and a cut in the charge would eliminate alternate hot and cold iron. A layer of coke of not more than 4 in. was advocated.

Gating was worthy of study to give the iron a chance in the casting. There was opportunity for saving in accurate cost keeping. Quick detection of the sources of defective work was possible by placing an inspector on the cupola platform and one in the sorting room. Molding machines had become a necessity as a result of the shortage of men and what now was needed was a conveyor carrying the molds. The speaker thought that while modern foundry construction was costly, it paid for itself in the attraction of workmen to light and well ventilated plants. He believed education of the young men of the industry was a step in the right direction, not only because it resulted in getting these men away from the idea that they were mere machines, but the training fitted them for the more accurate work than now is demanded.

The Pittsburgh Screw & Bolt Co. was organized in 1897, and for several years occupied a plant at Liberty Avenue and Twenty-fifth Street, Pittsburgh. It then acquired the plant and property of the Riter-Conley Co. on Preble Avenue, Pittsburgh, N. S., and moved to that location. The company since has spent large sums in betterments and its Pittsburgh plant now is recognized as one of the most modern in the country. The officers of the company are: William G. Costin, chairman; C. R. Ferguson, president; J. P. Hoelzel, George H. Lee, J. M. Yahres and H. L. Keally, vice-presidents; Valentine Manley, comptroller, and Frank B. Gordon, general superintendent.

To Sell Ashland Blast Furnace

ASHLAND, WIS., May 25.—Notice has been received here that the officials of the Charcoal Iron Co. of America have decided to close down the blast furnace at Ashland, Wis., and to place it on the market. The furnace was built about 20 years ago and for several years was operated continuously, but in the past five years it has been idle the greater part of the time.

Taxes, Trade Control and Employee

United States Chamber of Commerce Discusses Matters of Large Concern to Business— Favors Reduced Taxes

WASHINGTON, May 25.—Passing upon a score or more of questions of vital concern to the business life of the nation, the Chamber of Commerce of the United States in closing its thirteenth annual meeting at Washington, last week, elected John W. O'Leary, vice-president Chicago Trust Co., as its president, succeeding Richard F. Grant, who declined to stand for re-election. Among his other interests, Mr. O'Leary is a director of the Illinois Car & Mfg. Co.

Among the interesting subjects passed upon by the Chamber were those relating to Federal taxation, which it was decided to refer to a committee for careful consideration; approval of the new procedure of the Federal Trade Commission and discussion of employer-employee relations.

The Mellon plan for tax reduction was favorably discussed at the meeting. Secretary Mellon has indicated that the Administration will not attempt further to have Congress adopt a constitutional amendment to remove tax-exempt securities from immunity. The principal feature of his plan calls for reducing the surtax maximum to 25 per cent and advancing the starting point of surtaxes to \$15,000 or \$20,000 a year. Mr. Mellon pointed out that the man whose income is subject to the high brackets of the surtax finds that a taxable investment must yield about 8 per cent to equal the net return of a 4.5 per cent tax-exempt security. At the same time, under a total normal and surtax of 20 per cent as against the present maximum of 40 per cent, the Secretary has stated, a taxable security yielding slightly more than 5.5 per cent would be equal in net return to a 4.5 per cent municipal, state or national bond.

Federal Trade Commission Practice

The Chamber's approval of the new procedure of the Federal Trade Commission followed an address by Commissioner William E. Humphrey. The Commissioner explained the new procedure, which already has been published in *THE IRON AGE*, but went further and criticized the Senate for resolutions it has passed calling upon the commission to make certain investigations. Mr. Humphrey asserted that the only investigations Congress can call upon the commission to make, according to the Federal Trade Commission Act, are those relating to alleged violations of the anti-trust acts. He boldly asserted that many of the resolutions passed are of a purely political character.

"So far as I can prevent it," he said, "the Federal Trade Commission is not going to be used as a publicity bureau to spread socialistic propaganda. In so far as I can prevent it, the commission is not going to be used to advance the political or personal fortunes of any person or party."

Mr. Humphrey cited figures showing the results of the first 70 days he was a member of the commission, during practically all of which time the new rules were in effect. He pointed out that there were issued 22 complaints; 28 orders to cease and desist; 41 complaints dismissed, and 110 applications for complaints dismissed. In the future, it is said, there will be no such record of dismissal as compared with the orders issued. The "creed" of the majority of the commission, as now composed, was set out by Mr. Humphrey as follows:

"We do not believe that success is a crime;
"We do not believe that failure is a virtue;
"We do not believe that wealth is presumptively wrong;
"We do not believe that poverty is presumptively right;
"We do not believe that industry, economy, honesty and brains should be penalized;
"We do not believe that incompetency, extra-

gance, idleness and inefficiency should be glorified;
"We do not believe that big business and crooked business are synonymous.

"True, we will give closer scrutiny to big business than to small business, because of its greater power for good or evil.

"We believe that 90 per cent of American business is honest.

"We believe that 90 per cent of American business is anxious to obey the law.

"We want to help this 90 per cent of honesty.

"We want to control or destroy the 10 per cent that is crooked.

"In this endeavor, we want your help. We hope to deserve it."

Employee Representation

Discussion of employer-employee relations included an interesting paper by W. C. Dickerman, vice-president American Car & Foundry Co., New York, who stressed as a hopeful sign for the future the growth of industrial representation, and joint control of certain phases of industrial management by manufacturers and employees. He said the number of works councils in American industries, representing both employees and management, has grown from 225 in 1919 to 814 in 1924, and the total number of employees represented on these councils has increased during the same period from 391,400 to 1,177,037.

"This growth," he said, "is in the face of heavy abandonments in the mining, lumbering and shipbuilding industries. The works councils introduced by the agencies of the Federal Government have largely been given up. With a development so young, obviously too much cannot be expected. The plan must be comprehensive and give wide latitude to the control of wages and hours of work. In the wage, we touch the nerve center of the industrial body. From it radiates all other interests. This is fundamental, and still a wide divergence exists. The International Harvester plan gives control to the representative body, subject to appeal only in the case of a disagreement. The Colorado Fuel & Iron Co. plan gives little or no control to the representative body.

"In a form of industrial representation lies the industrial hope of the future. The progress made in the past ten years is an earnest of what can be expected as the years pass. Pictured against the somber background of 5000 years, how bright and how pregnant with hope is the progress made in the last century. Justice, knowledge and generosity are the handmaidens of the present day industrialist."

Walter V. Berry has resigned as sales and foundry engineer of the Lava Crucible Co., Pittsburgh, to become manager of the Metal Improvement Co., Cleveland. After leaving school, Mr. Berry received his foundry training with the Keystone Bronze Co., Pittsburgh, working his way through the various departments. Later he became district sales manager of the Pennsylvania Products Co. in Portland, Me., returning during the war to New Brighton, Pa., to help organize the Berry Metal Co. Mr. Berry and his father perfected a tinless phosphor bronze which they used in making various kinds of mill bearings, during the latter part of the war. The Berry company finally combined with others to form the Ideal Foundry & Machine Co., Beaver Falls, Pa., with Mr. Berry supervising foundry departments. He became associated with the Lava Crucible Co. in 1923.

Production of passenger automobiles in Great Britain in 1924 is reported by *Economist* (London) at 107,000 cars, equal to that of the two previous years combined.

Extra Incentive Wage Plans Grouped

Classification of Plans Features Chicago Management Conference—Incentive Methods Attacked on Social Grounds —Profit-Sharing Not Adapted to Rank and File

THAT extra incentive wage plans have long since passed the experimental stage and are now firmly entrenched in many important branches of American industry was made clear at a conference on such plans held by the Production Executives' Division of the American Management Association at the Drake Hotel, Chicago, May 21 to 23. In their early years of development extra incentive wage plans were devised by the cut-and-try method. Later, after several plans had been successfully applied, there was a period of aping. Today it is recognized that no one plan is a panacea, but that modifications and adaptations must be made to fit the peculiar problems of each plant. Moreover the manner of administering a plan is believed to be fully as important as the plan per se.

Confusion regarding proper terminology and the general principles underlying existing plans is now being dissipated by careful study and research. Undoubtedly the most important contribution to the conference was a mathematical analysis of financial incentive plans by Charles W. Lytle, director of co-operation, New York University, who classified all wage payment plans into four groups.

The conference did not concern itself merely with the details of specific plans or groups of plans. It also considered the subject from the broadest of humanitarian and social points of view. The fundamental basis for extra incentive plans was assailed by Victor Olander, secretary Illinois Federation of Labor, on the grounds that specialization of tasks and increased speeds of production were transforming workmen into automatons. An able defense was presented

by Frank P. Cox, manager West Lynn, Mass., works, General Electric Co., who pointed out that our present standard of living would not have been possible without the greatly increased productivity of industry and that any plan of wage payment which makes a workman usefully busy all of the time instead of uselessly busy part of the time is a benefit to him, to the community and to the nation at large.

Profit sharing schemes were touched upon, but it was the consensus of opinion that they do not stimulate output and are not applicable to the rank and file of employees.

The registration at the conference was 271, or 22 more than at the November meeting of the Production Executives' Division at Cleveland.

* * *

A number of production executives presented papers describing in detail extra incentive wage plans in effect at their plants. It was generally agreed that extreme care should be exercised in time study so that a fair time be set for a given task. Once a standard time is set, it should not be changed unless the method of operations is altered or different equipment is installed for performing the work. A plan should be simple so that it can be understood by the workman and so that administration and clerical expenses can be kept down to the minimum. Premiums or bonuses should be paid as promptly as possible, as it has been found that the best way to keep men interested in extra incentive inducements is through prompt payment. A plan should render cost-keeping easy.

Description of Specific Plans Now in Use

Western Electric Co.

NINETY per cent of the manufacturing employees of the Western Electric Co. works at Hawthorne, Ill., work under a piece rate plan with a day guarantee, said Stanley E. Holmes, assistant works manager. This plant at times employs as many as 42,000 people. The plan is applied to both skilled and semi-skilled workers and to laborers. Janitor service, trucking and clerical work have been successfully handled under the plan. The basic labor rates have been established to conform with ruling rates in the Chicago district, so that piece work earnings will be somewhat higher.

The company considers all piece work operators for a revision of rate every six months. When an operator's rate exceeds the maximum for a grade of work, he is considered for advancement to a higher grade. Gang piece rates are applied on assembly work. A unit rate is established for each operation and payment is based on the completed job—the quantity of good pieces times the rate per piece. Individual incentive rates are more effective than gang rates, but in some instances that advantage is outweighed by the increased cost of inspection, supervision and clerical work.

Clothing Industry Plans

The Western Electric Co. has a fairly steady market for its products, in sharp contrast with the seasonal character of the clothing industry, said Willard E. Hotchkiss, executive director National Industrial Federation of Clothing Manufacturers. In the clothing industry the effect of piece rates on costs is primarily dependent upon the success of a company's

merchandising policy. The product of the industry is constantly changing, necessitating continual readjustment of rates. Moreover the industry has to deal with a strong union and piece rates are fixed by collective bargaining under an umpire. In view of the bargaining system time study can be used only as a supplement—as one of several approaches to finding out what a job is worth. Owing to the fluctuating character of their business, clothing manufacturers do not feel that they can guarantee a minimum day rate regardless of output. Their attitude is that if there is no work, there should be no pay.

John Deere Harvester Works

A straight piece rate system with a day rate guarantee when work is slack has been in effect in the plants of Deere & Co. for twenty-one years, said Charles N. Stone, manager John Deere Harvester Works, Moline, Ill. It is highly important that doubt, in the worker's mind, as to the permanence of piece rates, once they are set, should be dissipated. His company makes one-year contracts with its men, which it rigidly adheres to. In some instances, in fact, five-year contracts have been entered into.

Harder Mfg. Co.

In the plant of the Harder Mfg. Co., Cobleskill, N. Y., an extra incentive plan has been extended to foremen, according to a paper delivered by A. W. Rowley, production engineer. Bonuses are paid on the basis of increased production, reduction in costs and suggestions. For all suggestions offered by employees that are adopted both the employee and his foreman are rewarded. This is to insure that foremen take a

A Classification of Financial Incentive Plans

Every wage payment plan involves some definite arrangement between two variables—the amount of production given by the employee and the amount of money given by the employer, said Charles W. Lytle in a paper entitled "A Mathematical Analysis of Financial Incentive Plans." These arrangements are not loose, but rigid.

Principle 1. Time Rates (Employer taking all time saved or lost)

THE day wage or the time plan can be expressed by a straight line. The fact that this earning line is parallel to the production axis demonstrates that of itself it is independent of the quantity of production. In other words, there is a constant wage regardless of the amount produced. The level of the line is determined by the rate. The earnings are equal to the actual hours times the rate per hour. When several hourly rates are given for different production ranges, the earning line breaks up into a series of horizontal lines, each successive one a definite amount higher than the one preceding and between definite production points. Such a plan is called the multiple time rate plan.

Principle 2. Piece Rates (Employee taking all time saved or lost)

THE piece rate plan might be looked upon as a special case of the multiple time plan in which the rate increment is directly proportional to the production increment, that is 10c. for 1 piece, 20c. for 2 pieces—\$10 for 100 pieces. Instead of representing this law by a series of steps we merely draw a line through all the periodic points so that the earning line is straight and passes through the origin. Because a piece rate graph is an infinite series of steps, the change in rate per piece changes the slope but the law of direct proportion necessitates that *all piece rate lines pass through the origin regardless of the amount of slope*. In this case earnings equal the number of pieces times the rate per piece.

As in the case of the time plan, we may combine several rates, beginning and ending each at some definite production point. Such a combination of piece rates is called the multiple piece rate plan and includes the so-called "differential" step idea. This was utilized first by Taylor and intended to demarcate the task point and provide penalization for production below that point, together with generous reward for production at and above it. The task is therefore high. Since, if time wasted relative to the task is all lost by the worker and if, on the other hand time is saved, the worker gains it all, the piece rate system is sometimes called the 100 per cent premium plan. The plan has another alias. It is called the standard hour plan. Since a task is a specified number of pieces per hour this amount is called a standard hour's

work. If the rate per piece is 10c. and the task is five pieces per hour, then the wage per standard hour is 50c. The workman is merely paid this rate times the number of standard hours of work accomplished instead of the rate per piece times the number of pieces. The earnings are equal to the actual time plus the time saved times the rate per hour.

This plan is also used with a guarantee of a time rate for production below the task. Such plans should be called piece rate with a day guarantee, 100 per cent time premium with day guarantee, standard hour with day guarantee, or the Manchester plan.

Principle 3. Sharing of Time Saved or Lost (Between employer and employee)

THE next principle in the development of wage incentive is the sharing of time saved between employer and employee. While this must be considered a distinct principle, yet even here the piece rate plan is the extreme of it, the employer's share being zero. When everything is considered this is far from the case because there is a substantial saving in overhead which goes entirely to the employer. A constant fraction may be used to determine the share as in the Halsey premium plan or a variable proportion may be used as in the Rowan plan. The formula is more easily understood in the former case but the resulting earning graph is a straight line which has a slope less than normal piece rate. In the second case the earning graph slope may even exceed normal piece rate below task but it drops off rapidly as production increases.

Principle 4. Empirical Formula or Arbitrary Efficiency Scale

THE fourth and last principle used in modern wage plans is the empirical formula or arbitrary efficiency scale as used by Emerson. This principle is so flexible in its possibilities that one might locate a series of points anywhere on the diagram and draw the earning curve through them. In fact, that is about what the followers of Emerson have done. Emerson himself uses arbitrary points only between 66 per cent task and task. Below 66 per cent task he provides a time guarantee. Above task his plan can be expressed in terms of time and normal piece rate. In fact, his earning line approaches that of normal piece work as the hours actually taken to do the task approach zero.

In Professor Lytle's opinion all other plans are combinations of two or more of the four principles he has discovered. Charts showing graphically the mathematical principles of seventeen extra incentive wage plans were exhibited by him at the conference.

keen interest in all suggestions emanating from their departments. The bonuses for production and reduction of costs were formerly based upon the results of each department but this was not conducive to co-operation between foremen. Now bonuses are based on the efficiency of the factory as a whole, the size of the bonus being in proportion to the responsibility imposed on each foreman.

Maxwell Motor Corporation

A group wage payment plan has been in effect in the Maxwell Motor Corporation shops for the past two years, according to H. G. Perkins, industrial engineer of that company. It replaced a piece rate system which was abandoned because of inaccuracy and fraud in counting work and the inordinate clerical expense involved. Men now work together in logical groups having common interests and are paid regular hourly rates plus a bonus when the gang produces in excess of standard output. The company employs 10,000 and has obtained equally satisfactory results in single purpose departments and departments making varied products. The increase in productive efficiency has been spectacular, ranging from 12 to 25 per cent. The amount of scrap has been materially reduced, as inspection is far easier under the gang plan than under the individual piece rate system. Group interest is keen. Old workmen make it a point to train new members of a gang. Indolent workmen, if they do not perform, soon drop out of the gang because their fellows will not tolerate them. The company itself rarely finds it necessary to take the initiative in discharging an unsatisfactory employee.

Milwaukee Electric Railway

The Milwaukee Electric Railway & Light Co. has adopted the payment-by-result method to a far greater extent than any other public utility. Its experiences were described by Ralph E. Moody, research engineer. The Halsey plan is rather generally applied, but with fully 100 distinct variations. Eighty-five per cent of the company's 5000 employees receive extra compensation under an extra incentive scheme. Owing to the widely different types of work performed by the company's employees many variables must be taken into account in fixing standards. For outside workmen, such as linemen, seasonal weather conditions must be compensated for in the standards. The traveling allowance might be said to have a definite ratio to the depth of snow in the winter. A general bonus is paid to 15 per cent of the employees who have not yet been put on a measured output basis. All bonuses are paid once a month with the pay check, one-half in cash and the remainder in the form of installment stock in a building and loan association.

Westinghouse Electric & Mfg. Co.

The system used at the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is an adaptation of the Gantt task and bonus plan, having a time guarantee and then a step up at the point where the task is performed in the time set, with piece work beyond. However, the guarantee at the Westinghouse plant is relatively high and the incentive relatively low, said H. W. Arlin, works manager's department, in discussing the plan. He also pointed out that skill, length of service, dependability and other factors were taken care of in the individual rates of the workmen; hence workmen may be working side by side on identical jobs at different rates. The desire of the management is to compensate employees also for factors other than speed.

Ritter Dental Mfg. Co.

A modification of the Halsey premium plan is used at the plant of the Ritter Dental Mfg. Co., Rochester, N. Y. Under the original Halsey plan rates were not based on time study and the company shared in the premium. The Ritter company uses time study and gives the entire premium to the worker. There are from 40,000 to 50,000 different operation rates and under piece work, all of these rates would have to be changed in case business conditions warranted a gen-

eral advance or reduction in wage levels. Under the plan used, there are only 300 separate hourly rates. The company's 300 employees now produce more than 500 did formerly. The earnings of the men have increased 50 per cent and the hourly rates only 10 per cent. The turnover of employees in 1924 was only one-half what it was in 1923.

All extra incentive wage plans are defective because they do not adequately take into account fatigue, said Harrington Emerson, in commenting on the various papers. A workman gets the same rate whether he works two hours, eight hours or twelve hours a day. There also seems to be a misapprehension that low base rates are desirable, as well as a constant fear that a man may earn too much.

Chapin Hoskins, managing editor of *Factory*, pointed out that an incentive system usually has a value besides its value as an incentive. It facilitates planning and cost control, it simplifies the transfer and promotion of men, it promotes accuracy in pay roll accounts, it bases a factory control system on production instead of accounting. A successful plan must dove-tail with other problems of production to prove satisfactory to management. The Packard Motor Car Co., for example, prefers to have the incentive less strong and the gangs larger so that the management can better visualize the production situation in all departments.

Bucyrus Co.

In a symposium on extra incentive wage plans, presided over by C. B. Tyler, vice-president Acme Wire Co., New Haven, Conn., Mr. Rose, the Bucyrus Co., South Milwaukee, Wis., described the pay period equalization plan used by his company. Under this scheme if a worker uses excess time on a job he suffers a proportionate reduction when his pay is computed over a given pay period. Previously the men were not concerned when they did not perform a task in standard time, because they received the standard time rate anyhow. Since the change was introduced, however, production has increased 10 per cent.

Holeproof Hosiery Co.

E. E. Brinkman, industrial engineer Holeproof Hosiery Co., Delavan, Wis., was a strong exponent of preserving the sanctity of a piece work rate no matter how much an exceptional operator might earn, even though it be in excess of what supervisors might be paid. The chairman stated that in his plant if any foreman can demonstrate that he isn't receiving 15 per cent more than the average for his best operators, he automatically gets a raise.

A psychological study of an experiment with a wage incentive plan was presented by Harry D. Kitson, professor of psychology, Indiana University, who was one of the dinner speakers. He showed how production increased to a certain level and rested there. This stereotyping of production—one of the characteristics of the learning curve—may have various explanations. One that he offered was that the operators thought they could avoid danger of discharge during dull periods by maintaining that rate. This suggests that production reached the maximum which could be produced by that particular incentive. A mere change, no matter what it is, may increase output. In the laboratory it has been demonstrated that a change in the color of an object will increase production. Another result of his experiment was that it showed that the less experienced operators reached a higher level of proficiency than the more experienced men. This was probably due both to the lesser age of the less experienced men and their greater adaptability because their former habits of work were not so strongly fixed.

Production is a means to an end and not an end in itself, declared Victor Olander, secretary Illinois Federation of Labor, another dinner speaker. When we produce two bolts where one was made before, we must remember that the two bolts have no value except as they increase the happiness of mankind. Industry with its split seconds, percentages and speed may succeed in hurrying the workman for a time, but eventually the effects will show up in the man's very

spiritual nature. The greatest of all incentives—satisfaction in accomplishment and achievement—is entirely absent from the extra incentive wage plans. The greatest thing in the world is man himself and no system of production is worth while unless it increases his happiness.

What Incentives Can Accomplish

The manager's viewpoint was presented by Frank P. Cox, manager West Lynn, Mass., works General Electric Co. He pointed out that the same country which barely supported a handful of Pilgrims now supports more than a hundred million with the poorest on a better standard of living than those historic pioneers. This was accomplished only through increased productivity. With the scale of living constantly advancing industry must find more efficient means of supplying increased wants. The function of management is to convert material in one form through labor to material in another form for the benefit of society. Low wages are not desired. Improved methods, however, mean the faster travel of materials through the factory, larger profits and higher wages, if those wages are earned. They widen markets, improve living conditions and contribute to more general contentment. The problem is to produce more and cheaper goods for consumption by the community of which the employee is a part. If costs are reduced they will ultimately be reflected in lower prices because absurd profits invite competition. An incentive which makes for fatigue is bad, but one which utilizes what was waste time is a benefit to humanity. It is just as tiring and fatiguing to soldier as to work. Idle motions are as fatiguing as useful ones. A plan which makes a man usefully busy all the time instead of uselessly busy part of the time is a boon to the workman, the community and the nation.

As an efficiency arrangement profit-sharing is

limited to high groups and small groups, said Ralph E. Heilman, dean school of commerce, Northwestern University, Chicago, at a luncheon meeting. Many firms have abandoned it for the rank and file of employees and have retained it for supervisory forces. Where the general plan has persisted, it has been in relatively small plants. The higher the rank of a member of the supervisory staff the greater the possibility of influencing profits. It is easier for the executive to visualize the relation between his efforts and profits. He is more familiar with business uncertainties and vicissitudes. A lean year will wreck general profit-sharing but will not undermine the faith of a member of the supervisory staff. The managerial plan is also to be recommended because there is no other yard-stick for the supervisory class.

The larger the group to which a plan is applied, the more difficult it is to educate the individual regarding profit-sharing and its responsibilities.

Dennison Mfg. Co.

A profit-sharing plan successfully applied to both the rank and file and to the management was described by John A. Garvey, personnel manager Dennison Mfg. Co., Boston. Originally the plan was confined to the managerial employees but it was extended to others at their request. It has had an important effect on incentive. Steady operations have been possible even in dull times because of the extra efforts put forth by the sales department. Labor turnover, which was 52 per cent in 1919-1920, has dropped to 16 per cent. Notwithstanding a reduction of 135 in the factory force, production is greater than last year at this time. The profits are distributed to employees in the form of industrial partnership stock, voting stock to the managerial employees and non-voting stock to the rank and file.

UNFILLED SHEET ORDERS

Buyers Last Month Met Needs Largely from Old Contracts

An interesting feature of the April report of the National Association of Sheet and Tin Plate Manufacturers is the apparent success of producers in securing specifications against old orders. This is seen in the fact that, while the sales of the reporting companies reached a total of only 193,949 net tons, a decrease as compared with March of 69,717 tons, the shipments in April, which amounted to 263,174 tons, were only 16,263 tons less than those of the month before. It will be observed, also, that last month's shipments were 69,225 tons in excess of the sales. Stocks on hand awaiting shipment, i.e., unshipped stocks, were reduced 7839 tons last month and unsold stocks at the end of April were 6450 tons smaller than at the end of March.

Adding the excess of shipments over sales and the decreases in unshipped and unsold stocks indicates that the obligations of the reporting companies were reduced 83,514 tons in April. A comparison of unfilled tonnages as of April 30, and of March 31, however, shows last month's decreases in mill obligations to have been 86,997 tons.

Unfilled orders as of Dec. 31 last were 663,460 tons. For the first four months of this year sales have aggregated 934,635 tons, production 1,171,104 tons and shipments 1,081,336 tons. The shipments in that period have exceeded sales by 146,701 tons and, theoretically, the obligations of the mills, as of April 30, should have stood at that much below those of Dec. 31. Actually, the unfilled orders at the end of last month were 200,035 tons less than at the end of 1924. Production in the four months exceeded sales by 238,469 tons and shipments by 89,768 tons. The total of unshipped and unsold stocks as of April 30 was 137,499 tons, an increase compared with Dec. 31, last, of 5900 tons. It is evident that the monthly figures do

not lend themselves to periodic analysis, and that each month is a separate story in itself. There is no doubt that discrepancies developed by analysis are due to the fact that no two months refer to exactly the same units; there is another explanation in the fact that "adjustments" can be and are made after each monthly report is compiled and published.

The report for April with comparisons, figures in net tons, follows:

	1925	1924		
	April	March	February	April
Number of mills...	702	702	702	686
Capacity per month...	422,000	422,000	386,400	412,000
Per cent reporting...	73.2	73.2	73.2	71.1
Sales	193,949	263,666	235,980	182,293
Production	210,082	290,308	282,290	234,000
Shipments	263,174	279,137	255,080	235,967
Unfilled orders	462,425	550,422	565,128	362,467
Unshipped stocks	86,235	94,074	105,944	92,629
Unsold stocks	51,264	57,714	53,717	48,945
Percentages to Capacity				
Sales	60.6	85.2	82.1	61.8
Production	87.5	90.7	96.5	79.0
Shipments	82.2	90.3	89.8	79.7
Unfilled orders	144.7	177.8	199.1	122.4
Unshipped stocks	26.9	30.4	37.3	31.3
Unsold stocks	16.0	18.6	18.9	16.5

Master Specification for Wire Rope

Circular No. 208 of the Bureau of Standards, Washington, covers United States Government master specification No. 297. This is to be officially put forth by the Federal Specifications Board, June 1, for the use of government departments and other establishments, in the purchase of wire rope. The pamphlet of 37 pages may be obtained from the Superintendent of Documents, Government Printing Office, Washington, at 15c.

Material and workmanship, including tests of the wires and galvanizing, together with strand fabrication, are covered in detail. Rope of varying characteristics is considered, including that with a core and cable made with rope which itself either has a core or is made up solid of strands of wire. Various grades of steel and phosphor bronze are covered and instructions are given for handling wire rope, including seizing, cutting, attaching clips and eyelets, etc.

Engineers Discuss Materials

Effect of High Temperatures and Value of X-Ray Inspection Presented at Milwaukee Meeting of Mechanical Engineers

THIRTEEN professional sessions at which more than 35 papers and a wealth of written discussion were presented, together with a large number of excursions to various manufacturing plants, provided much of interest and benefit to the 1125 members and guests attending the spring meeting of the American Society of Mechanical Engineers, held at the Hotel Pfister, Milwaukee, May 18, 19, 20 and 21.

The attendance was close to, if not the largest, of any of the society's spring meetings. In addition to papers relating to power, there were several dealing with materials, machine shop practice, materials handling, management of steel foundries and apprenticeship.

The Midwest Power Show, held at the Milwaukee Auditorium during the same week as the meeting, was also a center of interest. There were more than 200 exhibits of power plant and other equipment.

The banquet held Wednesday evening, May 20, was followed by addresses by the Hon. E. L. Philipp, ex-Governor of the State of Wisconsin; the Hon. Dwight F. Davis, Assistant Secretary of War, and Dr. William F. Durand, president of the society. F. H. Dorner, chairman of the Milwaukee Section of the A. S. M. E., was toastmaster. Mr. Davis made a plea for comprehensive industrial preparedness as insurance against war. The industrial preparedness plans, already set forth in detail in these columns, do not, it was emphasized, contemplate the manufacture of a single gun or other material, but are "paper" plans only, to be put into effect only on the threat of danger and when the American people, through Congress, give authority. It was brought out that a total of 456 plants in Wisconsin had been allocated for survey, about one-third of these plants being in Milwaukee. Factory plans have been drawn up with the Allis-Chalmers Mfg. Co. and the Federal Pressed Steel Co., both of Milwaukee, and with the Gisholt Machine Co., Madison, Wis.

There was discussion of procurement planning and industrial mobilization at a session held under the auspices of the society's national defense division and the Chicago Procurement Planning Association. Col. Frank A. Scott, president, Warner & Swasey Co., Cleveland, presided, and Hobart S. Johnson, vice-president, Gisholt Machine Co., was one of those leading the discussion.

New Officers Nominated

William L. Abbott, chief operating engineer of the Commonwealth Edison Co., Chicago, was nominated as president of the society, to succeed Dr. William F. Durand. A. G. Christie, professor of mechanical engineering, Johns Hopkins University, Baltimore; W. T. Magruder, professor of mechanical engineering, Ohio State University, Columbus, Ohio, and Roy V. Wright, managing editor of *Railway Age*, New York, were named as vice-presidents. William Elmer, superintendent of the middle division of the Pennsylvania Railroad; R. L. Daugherty, professor of mechanical and hydraulic engineering, California Institute of Technology, Pasadena, and C. E. Gorton, chairman of the American Uniform Boiler Law Society, New York, were nominated to serve as managers. Erik Oberg, editor of *Machinery*, New York, was chosen as treasurer. Election will be by ballot of the entire membership, closing on Sept. 22, 1925.

Effect of Temperature on Strength of Materials Being Studied

The effects which the use of steam at higher pressures and temperatures has had upon the efficiencies of steam turbines and upon the materials used in the

construction of their parts, were presented in a paper by Hans Dahlstrand of the Allis-Chalmers Mfg. Co., Milwaukee.

The use of cast steel in place of cast iron for the high-pressure, high-temperature sections of a steam-turbine cylinder began several years ago with the use of steam temperatures of 500 deg. Fahr. or more, cast steel being still employed for the cylinder or stationary parts. Heat treatment of these cast steel parts for 700 deg. service was said to be of value, producing a structure of the material that is more stable for long service. It has also been found that the expense of annealing the cast iron parts of the major sizes of turbines is warranted.

It was brought out that extensive tests as to the effect of temperature on the strength and other properties of different materials have been carried out by the research department of the Allis-Chalmers company. The strengths of three materials, rolled high-chrome, high-nickel steel, forged 3.25 per cent nickel steel, and forged monel metal at different temperatures were shown graphically, one of the curves indicating the tensile strength considered desirable for a material suitable for steam-turbine service with a temperature of 1000 deg. Fahr. Additional tests to determine the behavior of different materials when subjected to sustained or continuous stresses at different constant and high temperatures are in progress. These tests cover also the effect of repeated heating and cooling by steam of turbine structures.

The development of satisfactory turbine structures has been found, it was stated, to depend upon the resistance of the different materials to repeated or reversed stresses, and tests have been in progress for several years to determine the resistance of the materials employed to fatigue or progressive failure. A curve was presented to show the effect of repeated stresses.

Confusion Between Corrosion and Erosion

In discussing the application of the newest non-corrosive ferrous alloys to steam turbine work, it was stated that there has been considerable confusion between corrosion and erosion. Non-corrosive steels have, in general, found their chief application for turbine blades and buckets and for valve-trim material. Records of past installations were said to indicate that the blading material or bucket construction of a turbine is more often and most severely attacked by erosion, with corrosion as a secondary action. The reaction type of turbine was said to have the erosive action on the blading confined inherently to a very few stages at the exhaust end of the machine. Corrosion tests have been made on finished turbine blading material under severe service conditions, the results of the tests being shown on slides, one of which pictured a section of monel metal blading, another of 3.25 per cent nickel steel, one of an alloy 80 per cent copper and 20 per cent nickel and another of ordinary carbon steel. The resistance to corrosion was in the order listed. The nickel steel and carbon steel were also subject to considerable corrosion, which was sufficient to make them unsatisfactory, as compared with non-corrosive materials for special blade service.

Cast Iron Suitable Only for Lower Temperature

It was pointed out that although cast iron maintains its tensile strength up to a comparatively high temperature, in the higher temperatures it will gradually change, increasing in volume even when exposed to comparatively low temperatures over long periods of time. It is therefore considered not suitable except

for low temperatures. Other materials now considered suitable for high temperatures or new materials now being developed will, it was stated, probably have similar characteristics when exposed to high temperatures over long periods of time. The heat-treated materials must be tested to see if, at comparatively low temperatures, the physical characteristics will gradually change. The need of a great deal of research and investigation before engineers can with full confidence go ahead with the construction of machinery for power plants using temperatures appreciably higher than those now being used, was emphasized by Mr. Dahlstrand.

A paper on "The Rational Design of Covering for Pipes Carrying Steam Up to 800 Deg. Fahr.," by W. A. Carter and E. T. Cope of the research department of the Detroit Edison Co., Detroit, brought out discussion. The paper presents an analysis of the problem of determining the most economical thicknesses of covering for steam pipes carrying high temperature steam.

High-Pressure Fittings Inspected by X-Ray

A session that was marked by large attendance and much discussion was that devoted to materials, which was presided over by J. H. Herron, consulting engineer, Cleveland.

"The X-Ray Examination of Steel Castings," a paper by I. E. Moulthrop, assistant superintendent of construction bureau, Edison Electric Illuminating Co. of Boston, and E. W. Norris, engineer, mechanical division, Stone & Webster, Inc., Boston, and read by the latter, was received with interest. The work covered by the paper was undertaken in connection with the construction of the Weymouth power station, part of the steam generating equipment of which operates at 1200 lb. pressure. This is the first commercial installation at so high a pressure and it was decided to take the precaution, unique in power plant engineering, of applying X-rays to the inspection of the steam fittings employed. These presented the double problem of high pressures and temperatures with the characteristic of high-pressure steam to increase inherent flaws during service.

The materials selected for the high-pressure steam service were forged and cast steel, and monel metal. The use to which the monel metal was to be put was considered not to warrant its special examination, and for the steel forgings the routine tests and analyses were thought satisfactory proof of quality. Steel castings, however, having occasionally shown flaws which could not be detected by ordinary inspection methods, it was therefore decided to use X-ray photographs as a means of assuring the desired quality of product.

The examinations were made at the Watertown Arsenal, the castings being inspected for the most part in the rough. After examination, castings were divided into numbered areas chosen so as to cover the critical parts. Valve bodies were investigated carefully in the neighborhood of flanges, to determine the soundness of the metal at these points of concentrated stress, radiographs being then made covering these areas and the results studied in connection with the casting itself. Slight shadows on the radiographs were frequently found to be caused by surface irregularities on the casting. In order to check the interpretation of the X-ray work a condemned casting showing a large number of characteristic flaws was carefully cut into sections so as to expose the flaws and these were then etched and compared with the radiographic negatives. Chemical and physical tests were also made as a check on this work, and it was found that in every case the original interpretation of the radiograph was fully borne out by the character of the casting at the point of examination.

Radiographs of various areas of several castings were shown and the flaws discussed, supplementary physical and chemical tests of these castings being also described and illustrated. The turbine casing halves inspected were said to be the heaviest castings ever examined by X-rays. Out of some thirty castings examined only five proved seriously defective.

The first section of the paper is devoted to an out-

line of the development of X-ray examination of materials, and a description of the apparatus employed. The various defects observable in steel castings as determined by the inspection and checking of hundreds of specimens were illustrated and briefly discussed.

Radiographic Testing Has Come to Stay

F. C. Langenberg and H. H. Lester, Watertown Arsenal, Watertown, Mass., were among those presenting written discussion. It was brought out that by the X-ray test sections up to 3½ in. thick can be examined with comparative ease and flaws detected in a section of this thickness of less than 1/16 in. in diameter. Fine cracks are not so easily detected, but the technique of improved definition is increasing the ability to find these elusive imperfections. The ability to penetrate sections of greater thickness was said to depend upon the development of higher powered X-ray tubes, more sensitive films and more powerful intensifying screens, work on all these devices being in progress. It was said to be probable that in a year or two sections as thick as 7 to 8 in. could be examined. Radiographic testing in the steel casting field was said to have come to stay. It was said that there is wide interest in the subject and considerable work of this nature is being done in England.

In the discussion of this paper by J. T. Norton, Massachusetts Institute of Technology, Cambridge, Mass., it was stated that radiographic examinations of castings are being made at that institution, and that the structure of welded joints are being studied by the same methods. In addition to determining the presence of blow holes, seams, cracks, etc., another adaptation of importance was said to be in the examination of metals for their crystal structure. The effect of cold work and heat treatment has been studied by this method, which also lends itself particularly well to problems related to the structure of alloys.

A. E. White, Ann Arbor, Mich., pointed out that engineers are desirous of finding a method of inspection that will not result in destruction of the product, and indicated that there are substantial possibilities in the X-ray inspection of metals.

The use of X-ray testing by the Chapman Valve Mfg. Co., Indian Orchard, Mass. was outlined by V. T. Malcolm and A. Sproat of that company. It was stated that the company has given faith in what X-ray testing has done to insure the integrity of castings, and it was predicted that rapid progress will be made in the method, which is at present in its infancy. The examiner of radiographs, it was stressed, should be skilled in foundry technique and capable of distinguishing between blemishes and defects, an opinion which was also expressed by several others entering into the discussion.

F. H. Morehead, assistant chief engineer, Walworth Mfg. Co., Boston, expressed the belief that X-ray examination of castings will not become a widely used method of inspection, the expense of the equipment and its cost of operation seeming to eliminate it as a factor in that field. However, it was stated that as a means of studying intensively a given repetitive operation, it is unexcelled.

Aluminum an Important Commercial Metal

"Aluminum and Its Light Alloys," a paper by R. L. Streeter, vice-president, United States Aluminum Co., and P. V. Farragher, technical direction bureau, Aluminum Co. of America, Pittsburgh, also brought out discussion. The purpose of the paper was to make available to the engineer data on the mechanical properties of these materials, the data given in the paper being the minimum properties obtained from numerous tests of commercial material.

At the same session a paper on "Stress Concentration Produced by Holes and Fillets," was presented by S. Timoshenko, research laboratory, Westinghouse Electric & Mfg. Co., Pittsburgh, W. Dietz of the same company being co-author.

Large Number of Plants Open for Inspection

The excursions arranged for the afternoons included visits to various manufacturing plants, and visits to

the city's sewage disposal plant, the Riverside pumping station and to the Lakeside power station, the present capacity of which is 100,000 kw. and which has a powdered-fuel boiler plant.

The excursion to the plant of the Allis-Chalmers Mfg. Co. was attended by more than 400 members and guests. Luncheon was served by the company, following which an extended inspection of the plant, which covers a ground area of 153 acres, was made. The products of the company include engines, electrical apparatus, compressors, hydraulic machinery, cement, crushing, flour mill, mining and metallurgical, saw mill and pumping machinery.

The manufacture of Corliss engines, uniflow and gas engines, Diesel engines and mining hoists at the plant of the Nordberg Mfg. Co., were inspected by a large number of members and guests. Three engines rated at 3750 hp. each for the Panama Canal Zone, and said to be the largest units built in the United States, were seen in the course of construction, as was also a 2000-hp. stationary unit. A 1250-hp. Diesel engine was in operation and a 450-hp. Diesel under construction.

OHIO STEEL CONSOLIDATION

Merger Possibilities Are Being Canvassed in a Tentative Way

YOUNGSTOWN, May 26.—Press reports that a Middle West independent steel company merger is being discussed, while somewhat overemphasizing developments, nevertheless have an actual basis in fact. A number of interests in the Mahoning Valley are being mentioned in connection with a suggested consolidation, and steel men in some cases have been approached on the subject.

The reports mainly come from Cleveland, where the movement is being supported by a financial group. At least one Cleveland steel company would be included in such an amalgamation. While a five- or six-company merger has been discussed, it is considered more likely in this territory that any consolidation would embrace at the start two or three companies, which would form the nucleus, receiving accessions later.

It is the theory of those promoting the proposal that a merger would eliminate some unnecessary competition among makers whose finished steel lines are almost identical, and prevent the possible building of new finishing capacity in products in which there is overproduction. Price unsettlements at present, especially in sheets, are attributed to the abundance of existing capacity and to the keen competition resulting from the efforts of so many producers to run full. The most authoritative word on the subject of such a consolidation at present is that it is being considered, and has developed beyond the state of mere possibility. What the future holds with respect to its consummation and to the personnel is more or less conjectural, however.

To Entertain Mechanical Engineers in San Francisco

SAN FRANCISCO, May 26.—Arrangements are being made here by the local section of the American Society of Mechanical Engineers for entertaining the 1926 convention, as a result of the selection of San Francisco as the place for next year's meeting. Charles M. Gunn, local vice-chairman, in speaking about arrangements today said: "To bring out to the West the representative mechanical engineers of the country is quite an undertaking but we expect to show them that the West is worthy of their attention, because of recent engineering developments. It will be quite worth while for them to come to see what is being done in our Western cities and country and to discuss engineering problems of general interest. Everything possible will be done to make the San Francisco convention a notable gathering."

Officers of the local section who will have charge of

Visitors to the plant of the Vilter Mfg. Co. saw the manufacture of refrigerating machines and Corliss engines, the inspection of this plant including also the large pipe bending and fabricating shops. With apprentices as guides groups of visitors to the plant of the Falk Corporation inspected the pattern shop, core rooms, steel foundry and machine shops where herringbone gears for large and small reduction units were being machined. The manufacture of the Falk-Bibby coupling was also to be seen. Several members visited the plant of Kearney & Trecker Corporation, manufacturers of the Milwaukee milling machines.

In addition to the plants mentioned, 19 others were open for inspection. These included the plant of Illinois Steel Co., Bay View; the Globe Steel Tubes Co.; Sivyer Steel Casting Co.; National Enameling & Stamping Co.; the International Harvester Co., and the Chicago, Milwaukee & St. Paul Railroad shops. Among others were the Kempsmith Mfg. Co., Oil Gear Co., Milwaukee Electric Crane Co., Harnischfeger Corporation, Louis Allis Co., Cutler-Hammer Mfg. Co., and the Chain Belt Co.

arrangements are as follows: W. H. McBryde, California Hawaiian Sugar Refining Corporation, chairman; Charles M. Gunn, Gunn, Carle & Co., vice-chairman; Frederick Birdsall, Bethlehem Shipbuilding Corporation, secretary, and Alexander J. Dickie, *Pacific Marine Review* and Ely C. Hutchinson, Pelton Water Wheel Co., executive committee members.

Officers of Railroad Purchasing Association

Division VI, Purchases and Stores of the American Railway Association, at its annual meeting held at the Chase Hotel, St. Louis, May 19, 20 and 21, elected the following officers: Chairman, C. D. Young, stores manager of the Pennsylvania System, Philadelphia; vice-chairman, D. C. Curtis, chief purchasing officer, Chicago, Milwaukee & St. Paul, Chicago; general committee: A. W. Munster, purchasing agent, Boston and Maine, Boston; C. C. Kyle, general storekeeper, Northern Pacific, St. Paul; J. F. Marshall, purchasing agent, Chicago & Alton, Chicago; A. S. McKelligan, general storekeeper, Southern Pacific, San Francisco; G. E. Scott, purchasing agent, Missouri-Kansas-Texas, St. Louis; W. A. Hopkins, general purchasing agent, Missouri Pacific, St. Louis; C. B. Tobey, general storekeeper, Lehigh Valley, Wilkes-Barre, Pa., and W. S. Galloway, Baltimore & Ohio, Baltimore.

To Investigate Alleged Dumping of German Steel

WASHINGTON, May 26.—Based upon complaints from a committee representing steel producers and fabricators in the South and Southwest, the customs division of the Treasury Department has authorized the appraiser at New York to conduct an investigation concerning imports of merchant steel bars and other forms of steel from Germany. The charge has been made that steel is being dumped into the United States not only from Germany but other countries as well but the investigation just ordered will relate to alleged dumping from Germany only.

The appraiser likewise has been requested to make a report concerning claims of domestic makers of cast iron pipe that the latter product also is being dumped into the United States.

The report of the anti-dumping unit at New York with regard to the investigation as to alleged dumping of pig iron from India has been temporarily delayed, but is expected to be made soon.

The Ford Motor Co., Detroit, set a new production record May 19 when its assembly plants in the United States turned out 7858 Ford cars and trucks.

European Markets Are Despondent

Germany the Only Bright Spot; Even There, Quotas for June Are Reduced to 80 Per Cent—
England in Difficulties

(By Cablegram)

LONDON, ENGLAND, May 25.

IRON and steel position generally is bad. Pig iron buying is at a very low level. Consumers are still cautious and prices easier. Hematite is quiet, with little demand. Only nine furnaces on the North-East Coast are now blowing on hematite—the lowest number since the coal strike of 1921.

Foreign ore is dull. Bilbao Rubio is nominally 22s. (\$5.35) and North African ore 20s. (\$4.86), both c.i.f. Tees.

Finished steel is deadly dull. There are a few export inquiries but no important orders result except in special cases. Vickers, Ltd., Barrow-in-Furness, will build two submarines for the Australian Navy; also the gun mountings for one Australian cruiser already building in this country.

Sheets and Tin Plate

Tin plate activity is increasing. Consumers the world over are appreciating the current low levels of prices and considerable quantities are being sold, especially to German users. Australia and South America, also, are taking good lines.

Galvanized sheets are quiet, after their recent spurt to India, but other markets are taking small parcels fairly regularly and the makers' order books are moderately well placed. Prices are steady.

Black sheets are dull. There are few inquiries for Far Eastern specifications.

On the Continent of Europe

Continental markets are slightly better on improved inquiry, but business generally through traders here is still quiet. Consumers of semi-finished steel have bought some small lines of billets at £5 4s. (\$25.28) f.o.b., and sheet bars at £5 6s. (\$25.76) f.o.b. India has bought considerable quantities of Belgian joists

(beams) at £5 7s. to £5 8s. (1.16c. to 1.17c. per lb.) f.o.b., for July shipment.

In Belgium the Société Anonyme John Cockerill, at Seraing, has blown in its seventh furnace.

In Germany the Raw Steel Association has decided to reduce operations another 5 per cent to 80 per cent [for June]. Hahnsche Werke, A. G., Grossenbaum, Rheinland, Sächsische Gussstahl-Werke, Dohlen, near Dresden, Saxony, and Baroper Walzwerke, A. G., Barop, Westphalia, have now joined the association.

Negotiations still are proceeding regarding the formation of the Stahlwerksverband. The Peiner Walzwerk, A. G., Peine, North Germany, has agreed to come in, but the Linke Hoffmann group, Sächsische Gussstahlfabrik and Van der Zypen group are still outside. It is hoped to complete the association by the middle of June.

It is understood that the new German tariff proposals will not affect the basis of duties on imported pig iron or merchant steel; but special steels, ferro-alloys, hoop iron, wire and thin sheets are affected.

British Iron and Steel Trade in the Doldrums

LONDON, ENGLAND, May 14.—With the year approaching the close of the first half, the story of the iron and steel trades of this country continues in the same desultory vein and, in spite of the hopes held out at the end of last year, there is still no improvement to record. In some cases conditions may be described as infinitely worse. The policy of buyers all over the world seems to be that of purchasing nothing beyond absolute bare needs, with the result that the iron and steel capacity of the United Kingdom is far in excess of demand. Manufacturers of pig iron have curtailed their output to lessen their supplies but, even at the present reduced rate, consumers are buying only from hand to mouth.

British and Continental European prices per gross ton except where otherwise stated, f.o.b. makers works, with American equivalent figured at \$4.86 per £1, as follows:

Durham coke, del'd.	£1 2 1/2	\$5.47
Bilbao Rubio ore	1 2 1/2	5.47
Cleveland No. 1 fdy.	4 1	19.68
Cleveland No. 3 fdy.	3 16	18.47
Cleveland No. 4 fdy.	3 15	18.23
Cleveland No. 4 forge	3 14	17.98
Cleveland basic	3 15 1/2	18.35
East Coast mixed	4 0 1/2	19.56 to \$19.68
East Coast hematite	4 19	24.06 to 24.30
Ferromanganese	15 10	75.33
*Ferromanganese	15 5	74.12
Rails, 60 lb. and up	8 10	41.31 to 43.74
Billets	6 15	32.81 to 36.45
Sheet and tin plate bars, Welsh	8 12 1/2	32.20 to 34.02
Tin plates, base box	1 0 1/4	4.92 to 4.98
Ship plates	8 12 1/2	1.57 to 1.98
Boiler plates	12 10	2.71 to 2.82
Tees	8 10	1.84 to 1.95
Channels	7 15	1.68 to 1.79
Beams	7 10	1.62 to 1.74
Round bars, 3/4 to 3 in.	9 0	1.05 to 2.06
Galv. sheets, 24 gage	16 10	3.58 to 3.61
Black sheets, 24 gage	11 10	2.50
Black sheets, Japanese specifications	15 5	2.31
Steel hoops	10 15 and 12 10*	2.33 and 2.71*
Cold rolled steel strip, 20 gage	16 0	3.47

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports			
Foundry pig iron:(a)			
Belgium	£3 11s.	to £3 12s.	\$17.25 to \$17.49
France	3 11	to 3 12	17.25 to 17.49
Luxemburg	3 11	to 3 12	17.25 to 17.49
Basic pig iron:(a)			
Belgium	3 10	to 3 11	17.01 to 17.25
France	3 10	to 3 11	17.01 to 17.25
Luxemburg	3 10	to 3 11	17.01 to 17.25
Billets:			
Belgium	5 4	to 5 5	\$5.38 to \$5.55
France	5 4	to 5 5	\$5.38 to \$5.55
Merchant bars:			
Belgium	5 12 1/2		1.22
Luxemburg	5 12 1/2		1.22
France	5 12 1/2		1.22
Joists (beams):			
Belgium	5 8		1.17
Luxemburg	5 8		1.17
France	5 8		1.17
Angles:			
Belgium	5 18 1/2	to 6 0	1.25 to 1.30
3/4-in. plates:			
Belgium	6 17 1/2		1.49
Germany	6 17 1/2		1.49
5/8-in. ship plates:			
Luxemburg	6 17 1/2		1.49
Belgium	6 17 1/2		1.49

(a) Nominal.

Export trade both in pig iron and in finished materials is very poor, as is reflected in the April returns, the shipments of all kinds during that month having been only 297,458 tons, making the total for January-April about 60,000 tons less than a year ago. On the other hand the imports increase, the April figures having been 274,424 tons, making for the first four months an increase of nearly 300,000 tons, compared with the same period last year. There is still a great outcry at the shipbuilding orders which are lost to British yards, in some cases by very large margins, and various conferences are being held. In some quarters import duties on foreign materials are being pressed for, but it is doubtful whether anything in this direction will materialize.

Collapse of Tin Plate Scheme

The Tin Plate Price Stabilization Scheme has collapsed, after a duration of $2\frac{1}{2}$ years, and for the time being the market has been panicky. There is no doubt that manufacturers have benefited by the scheme but, as with all schemes of this nature, it works as long as there are orders to be had for the asking but, when

orders are scarce, and works hard up, dissentients will always be found, and methods adopted to get around the agreement. This had been going on for some time past, and the only possible outcome was the abandonment of the whole scheme.

With further reference to foreign competition in railroad material for colonial railroads, the following figures of tenders received by the Great Indian Peninsula Railway of India show that the lowest prices quoted in this country and from the Continent vary from 7 per cent to 35 per cent in favor of the Continental supplier.

	British Tenders		Continental Tenders	
	Highest	Lowest	Highest	Lowest
Laminated springs	£2,286	£2,074	£2,244	£1,749
Helical and volute springs	2,536	1,685	2,793	1,481
Rolled steel disk wheels and axles	5,509	4,415	5,837	3,701
Crank axles	665	374	400	274
Axle boxes	2,683	1,551	3,317	1,329
Steel tires	2,283	2,166	2,564	1,390
Copper tubes	1,188	1,074	...	880
Steel work for bridges	3,380	2,934	2,969	2,707
Solid drawn steel boiler tubes	7,061	3,443	2,674	2,329

BELGIAN MARKET WEAK

Semi-Finished Steel Active, but Other Materials Have Hard Sledding

ANTWERP, BELGIUM, May 6.—The market has remained weak during the last two weeks. While market tendencies are still undecided, some prices had again to give way slightly. Some makers, especially the big ones, are still well provided with orders. Prices are too low, with the high wages makers have to pay, and a large number of Belgian and other makers, with present quotations, are losing a lot of money. If a sounder position of the market is to be reached, further concessions must be accepted by workmen.

Many inquiries are on the market but only a few develop to definite orders. Most buyers and sellers, having definite opinions on prices, cannot meet as regards that price, although, on the other hand, a few exporters seem inclined to book for later specifications. They accept the makers' opinion that a general revival of the market will occur within a short time. More business came through from America during the last few days.

In the meantime French and Luxemburg competition remains strong, with equal prices in general. The general price for bars was 113s. or \$27.50 (1.23c. per lb.) f.o.b. Antwerp, basis price, with 112s. 6d. and even 112s. (i.e., \$27.25 or 1.22c.) for large quantities with favorable specification. Domestic quotations were higher, at 535 to 545 fr. (1.21c. to 1.23c.). Beams are quoted between 107s. and 108s., i.e., \$26 and \$26.45 per ton (1.16c. to 1.18c.) f.o.b. Antwerp. These prices show that, especially as regards bars, the market was slightly weaker. Several sellers, however, are keeping to higher prices and, in consequence, remain out of the market. German prices for wire rods keep low, hence the depressed quotations of these Belgian products. General prices for steel were approximately as follows, per ton f.o.b. Antwerp:

	Fr.	Per Lb.
Bars, basis	545 or \$27.50 or 1.23c.	
Beams	525 or 26.45 or 1.18c.	
Rods	635 or 32.00 or 1.43c.	
Corrugated bars	600 or 30.20 or 1.35c.	
Steel hoops	720 or 36.30 or 1.62c.	
Cold rolled hoops	1,050 or 53.90 or 2.41c.	
Drawn steel, squares	900 or 45.40 or 2.03c.	
Drawn steel, rounds	880 or 44.30 or 1.98c.	
Drawn steel, hexagons	970 or 48.85 or 2.18c.	
Spring steel	1,020 or 52.40 or 2.34c.	
Wire rods	615 or 30.90	
Rails	600 or 30.25	

Sheets.—Orders for heavy sheets (3/16-in. and up) were taken at £6 17s. 6d., i.e., \$33.45 (1.49c. per lb.), which means in reality the same as last week. Last fortnight's prices were 2s. 6d. higher. French competition (Lorraine makers) is very strong. Sheets of $\frac{1}{8}$ -in. thickness were offered at £7 7s. 6d. (\$35.85 or 1.60c. per lb.). After their last important fall thinner

material maintains its position more easily. Prices were approximately as follows:

	Fr.	Per Lb.
Thomas sheets 0.5 mm. (No. 26 gage)	1,120 or \$57.45 (2.56c.)	
Thomas sheets 1 mm. (No. 20 gage)	970 or 48.85 (2.18c.)	
Thomas sheets 2 mm. (No. 14 gage)	820 or 41.30 (1.84c.)	
Thomas sheets 3 mm. (No. 11½ gage)	725 or 36.65 (1.64c.)	
Thomas sheets 5 mm. (No. 6½ gage)	665 or 33.50 (1.50c.)	
Galvanized sheets 0.5 mm.	2,200 or 110.85 (4.95c.)	
Galvanized sheets 1 mm.	1,650 or 83.15 (3.71c.)	
Polished sheets, average price	1,450 or 73.10 (3.26c.)	

Iron.—This market is as depressed as formerly. Few orders are available. Most works are shut down several days of the week. Prices have gone still lower, while scrap and wages remain terribly dear. No. 4 quality shows a better aspect on account of its scarcity. Prices (mostly nominal) are:

	Fr.	Per Lb.
Commercial iron No. 2, basis	500 or \$25.30	
Commercial iron No. 3, basis	575 or 29.05	
Commercial iron No. 4, basis	600 or 30.25	

Blooms, Billets and Slabs.—The market for semi-finished material shows some good movement. Large purchases have suddenly been made by English importers, at prices asked by makers. Lower offers are still on the market but, as before, works do not take them. The quantities available are limited and, as prompt deliveries are asked for, this market, contrary to other steel commodities, is getting firmer. Prices are:

	Fr.	Per Lb.
Thomas billets, 2 in. to 4 in.	500 or \$25.30	
Thomas blooms, 4 in. and up	490 or 24.70	
Thomas slabs, 9 lb. and up	515 or 25.55	

Pig Iron.—Demand remains favorable, but prices are as low as last week; i.e., for phosphoric foundry No. 3, with 2.5 to 3 per cent silicon, the price is 350 to 355 fr. f.o.b. Antwerp, or \$17.90. Prices quoted for domestic supplies are somewhat higher. Lorraine and Luxemburg makers quote the same prices. Belgian hematite Bessemer pig iron runs 420 fr., i.e., \$21.15 f.o.b. Antwerp. Thomas basic pig is not much available.

Coke.—Prices have been somewhat lowered and a further reduction is still expected. Actual syndicate price is 135 fr. per ton (\$5.45).

The United States held first place on the list of countries of export for Russian manganese ore from the Chiaturi fields in March, according to official statistics received from Moscow by the Russian Information Bureau in Washington. The total exports for the month were 53,475 tons, of which 20,650 tons, nearly 40 per cent, were shipped to the United States, and 18,485 tons went to Germany.

Steel furniture shipments in April amounted to \$1,633,106, according to figures of the Department of Commerce. Except for January, this is the largest total since April of last year, at \$1,658,610. The March figure was \$1,583,604. For the first four months of 1925 the total was \$6,426,929, compared with \$6,317,660 in 1924 and \$5,899,135 in 1923.

FRENCH DEMAND IS POOR

Export and Domestic Conditions Leave Iron and Steel Market without Support

PARIS, FRANCE, May 15.—It is fine to say that stocks are neither undue nor cumbersome in the collieries and at works, yet it is impossible to deny that inland demand is extremely weak, and export still worse.

Pig Iron.—Inland as well as export business is becalmed. Phosphorus cast iron has its April prices applicable for May, and nothing has been decided for June. For any other grade than PL No. 3 (base) prices on truck, at par Longwy, follow: No. 1 PL, 350 fr. (\$18.53); No. 4 PL, 344 fr. (\$18.22); No. 5 PL, 343 fr. (\$18.16); No. 3 PR, 340 fr. (\$18.00); No. 4 PR, 336 fr. (\$17.80); No. 5 PR, 332 fr. (\$17.58).

Grades are sold also according to yield: For PL: 3 to 5 per cent Si, 350 fr. (\$18.53); 2.30 to 3 per cent Si, 343 fr. (\$18.16). For PR: 1.70 to 2.30 Si, 338 fr. (\$17.90); 1.50 to 2 per cent Si, 333 fr. (\$17.63); 1 to 1.70 per cent Si, 330 fr. (\$17.48).

Export market is stationary; prices are slightly easier at 345 to 350 fr. Belgian currency or 335 fr. French (\$17.74).

The market for hematite is steadily less well sustained; stocks are beginning to show, the more so as exports to Italy are getting rare and less important. Price rates are variable: in the North, 430 fr. delivered (\$22.77) for important tonnage, 1000 tons or more; for small tonnage, 440 to 450 fr. (\$23.30 to \$23.83) delivered; in the East, 420 to 425 fr. delivered (\$22.24 to \$22.50) for important quantities and 440 to 450 fr. (\$23.30 to \$23.80) for small ones; in the Center, where the outlook is frankly bad, quotations are 410 fr. (\$21.71) delivered; in the Southwest, 440 to 455 fr. (\$23.30 to \$24.10) for big tonnage and 445 to 460 fr. (\$23.56 to \$24.36) for small tonnage; the same hematite unloaded from vessel is sold on truck Dunkirk at 430 fr. (\$22.77).

Ferroalloys.—Ferromanganese is mostly sold at 1430 fr. (\$75.75) per ton, delivered. The spiegel grade, 10 to 12 per cent Mn, at 510 to 520 fr. (\$27 to \$27.54) per ton at works, or 535 to 545 fr. (\$28.33 to \$28.86) delivered; 18 to 20 per cent, 660 to 670 fr. (\$34.95 to \$35.48) per ton at works, or 680 to 690 fr. (\$36 to \$36.55) delivered.

Semi-Finished Products.—For export there is a slight improvement, but with prices weaker than last week, which has stimulated certain British firms to close interesting deals; quotations f.o.b. Antwerp: Blooms, £5 (\$24.20); billets, £5 3s. to £5 4s. (\$24.93 to \$25.17); largets, £5 5s. 6d. to £5 6s. (\$25.53 to \$25.65). For us these prices stand out at: Blooms 465 fr. f.o.b. Antwerp, which is not too bad; billets, 480 fr.; and largets, 491 fr.

Rolled Steels.—The dullest of all departments; orders are of the hand-to-mouth description and indifferent tonnage. The entente of prices also is having a severe ordeal—transgressions have been noted. The increased rate for tonnage of less than 100 tons has been suppressed, so that the basis price of 53 fr. (1.23c. per lb.) for merchant steels is applicable for 10 tons and less. Export business is slack and deals are difficult in certain cases; prices still resist. Beams are £5 8s. to £5 10s. (1.17c. to 1.19c.); merchant steels, £5 13s. (1.22c. per lb.).

Rails.—Negotiations with regard to rail producers, drawn out for months, have found a solution in the form of an entente of prices, the beginning of a national and, perhaps, an international comptoir in a near future. In principle the price of 630 fr. (\$33.36) has been brought forward for Broca rails, per ton, and 530 fr. (\$28.07) for Vignole rails, which are the current models for railroads. Always in principle, for nothing has yet been settled, the adherents of the entente are authorized to deal freely in Broca rails up to 200 tons, and with regard to Vignole rails, up to 500 tons.

Sheets.—With regard to medium sheets and more particularly to heavy sheets, works have no new orders and deliveries are carried out within a few days. Light

sheets are in slightly improved condition inland, with no change in prices, that is, they follow competition. Export business is dull and prices only just maintain their levels; heavy sheets, £6 16s. to £6 17s. (1.47c. to 1.48c.) and medium sheets, £7 7s. 6d. or 1.60c. per lb. (3 mm.) or No. 11½ gage; £7 2s. 6d. or 1.54c. (4 mm.) or No. 9 gage; £7 or 1.51c. (4.5 mm.) or No. 6½ gage.

Wire Products.—The wire producers' entente is settled; basis price is fixed at 592 fr. (\$31.35) per ton on truck, at works, Thionville. Wire rod for concrete (520 fr. or \$27.54), and wire rod for bolts and chains (545 fr. or \$28.86) were already part of the steel producers' entente. For export, wire rod is weak and much discussed in consequence of German and Sarre competition; price: £6 6s. to £6 7s. (\$30.49 to \$30.73).

Scrap.—Calm and prices unchanged; these conditions will prevail until the question of export is solved.

Coke.—For the first 13 days of May the coke arrivals amounted to 120,129 tons, making a daily average of slightly more than 9240 tons.

Canadian Iron Lower—Steel Mills Slowing Down

TORONTO, ONT., May 26.—The general listlessness that has featured the Canadian pig iron market for the past two months continues without signs of early change. For some time demand has been confined to quantities seldom exceeding 50 to 100 tons, practically all for spot delivery. There has, however, been a steady flow of orders against old contracts.

While the operations of foundries have failed to show the improvement predicted early in the year, steel mills became active about the first of March, since which time those at Sault Ste. Marie, Ont., and at Sydney, N. S., have been running almost to capacity, while the Hamilton mills have been operating around 65 per cent. The works at the two former centers have been chiefly engaged on rail orders, but it is now stated that the rolling of rails will be complete in about a month, when it is expected that the Algoma Steel Corporation and the British Empire Steel Corporation will find it necessary to greatly curtail operations, unless some unforeseen improvement makes its appearance.

The limited demand for foundry and malleable iron, together with the softening in prices in the United States market, has been reflected in a further decline in Canadian pig iron prices of all grades. The reduction which went into effect last week was \$1 per ton, with Canadian producers quoting pig iron as follows: No. 1 (2.25 to 2.75 per cent silicon), \$25.60; malleable, \$25.60; No. 2 (1.75 to 2.25 per cent silicon), \$25.10, Toronto. A decline of \$1 per ton was also reported in the furnace price of basic iron, which is now quoted at \$23 per ton furnace.

According to local blast furnace representatives the prevailing price of foundry and malleable pig iron is slightly below that at which Buffalo producers can sell in this market, that is, when duty and freight are taken into consideration. But when iron is imported from Buffalo for use in the manufacture of agricultural implements, (duty free), Canadian producers are unable to compete. Agricultural implement makers are buying the greater part of their pig iron in the United States market and it is stated that slightly more than 2000 tons per month are coming into Canada on this account.

Makes Non-Skid Steel Plates

HARRISBURG, PA., May 25.—The first finished steel plates of a new design manufactured by the Central Iron & Steel Co., Harrisburg, Pa., were laid on the two driveways of the Paxton Street bridge in South Harrisburg in the past week. The plates are designed for use on bridge floors, for stairways, for walkways and for similar purposes.

The new product is a tread plate, which contains slight projections to prevent skidding. A patent has been applied for by Robert H. Irons, for the Central Iron & Steel Co., of which he is president.

Iron and Steel Markets

REACHING A BALANCE

With Production Down, Some Prices Are Better Held

Large Pig Iron Buying in Central West and Inquiry Grows

The final week in May has added to the indications in the previous fortnight of a nearly completed adjustment of finished steel production to demand, and of a more stable situation in prices of the three leading products—plates, shapes and bars. In both these respects May has been a better month than April, at the same time showing improvement, even though slight, in the amount of new business booked.

While there is no change in the short delivery policy of buyers, evidence appears of a firmer attitude of producers, as their unit cost has risen with reduction of output. More cases are reported of the refusal of orders to which buyers have attached prices \$1 to \$2 a ton below those for which the larger companies have been standing for two or three weeks.

With production continuing at close to 70 per cent of capacity, the market is expected to give early evidence of the extent to which needs that have been deferred to get the lowest price have become urgent. The week has developed some cases of this sort. Orders for quick shipment are more numerous.

In the Chicago district, which for months has maintained the highest rate of output, the largest producer has now come to an 87 per cent operation. Pittsburgh and Youngstown steel companies show practically no change.

While automobile manufacturers continue to run up to capacity, farm equipment works are not so busy as in early spring. Their summer schedules, however, will be fuller than for several years.

The St. Paul road, which placed 5500 cars two weeks ago, is about to buy 1000 more besides giving orders for repairs on 2000 stock cars. Western plate mills also have before them 7500 tons of oil storage tank work, of which 4000 tons is for the Humble Oil Co. in Louisiana. A plate order for Vancouver, B. C., water lines, 5500 tons, was taken by the Steel Corporation at a price below the 2.38c. c.i.f. bid of an English mill.

Orders for thirty-two barges calling for 5700 tons of steel have been taken by a Pittsburgh fabricator, and Lake shipyards are figuring on two freighters in addition to those recently reported.

Sheet manufacturers, whose scramble for business has caused a steady decline in prices, are more generally holding at 3.20c. as minimum. In the tin plate market a concession of \$3 a ton, or to \$5.35 per box, has appeared.

The week's total of structural steel awards, upward of 35,000 tons, has been exceeded only a few times during the year. Reports to steel companies preliminary to inquiries for steel indicate that a large amount of building work is in prospect, particularly in New York.

In pig iron the largest buying has been in Central Western districts, Cleveland sales running up to 105,000 tons, with a total there for the month of about 285,000 tons. At Chicago, as buyers showed more interest, prices wavered and some sales were at a decline of 50c. from the level of the previous week.

A number of large foundry interests are sounding the market for the low point in the decline, and a good deal of buying without a general call for bids is reported. Thus far the movement is not comparable with that of last fall, but there are signs of its broadening.

Detroit, which secured the lowest prices on both foreign and domestic cast iron pipe at last month's lettings, is again in the market for 14,000 tons.

In heavy melting steel scrap the recent advance of \$1 in the Middle West has been without effect on the general situation. Thus far the activity in old material has been largely confined to dealers, and consumers have not been willing to pay the prices asked.

Iron and steel exports in April, 155,426 gross tons, maintained the March rate, which was 50 per cent above February. Of the April total, 132,636 tons was rolled and finished steel or nearly six times the 22,286 tons of imports of that description, in which is included in fact an unknown quantity of cast iron pipe.

THE IRON AGE composite price for pig iron has fallen to \$19.42 from \$19.63 last week, the tenth successive weekly decline. It now is \$3.08 below the high point of the year reached in mid January.

The finished steel composite price is unchanged and has stood at 2.460c. per lb. for four weeks. This is \$2 per ton below the level of early January and is back to the pre-election level, the low point of 1924.

Pittsburgh

Signs of Steel Consumption Exceeding Production—Operating Rate Sustained

PITTSBURGH, May 26.—The past week has brought almost no change in the steel market from its recent characteristics and tendencies. Reports about business still are on the side of improvement, but as was the case last week, the gain is seen in the number, rather than in the size of orders. Evidently, buyers want to be entirely satisfied that prices are going to hold before making extensive purchases and the demands now coming out in a large measure represent replacement requirements. There are no suggestions of any decrease in consumption; rather, the frequency of small lot purchases suggests that the use of steel is as heavy now as it has been at any time this year. The idea is common that inventories are fairly well in hand and on the demands that are coming out it is a matter of favorable comment that not much resistance to price is being encountered.

Business in tin plate still is good and the outlook for the year continues very favorable. Measurable improvement is observed in pipe business and while buyers are not ordering so far ahead as they did a few years ago, the leading producer is getting sufficient

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:		May 26, 1925	May 19, 1925	Apr. 28, 1925	May 27, 1924	Sheets, Nails and Wire:		May 26, 1925	May 19, 1925	Apr. 28, 1925	May 27, 1924
No. 2X, Philadelphia	21.26	\$21.26	\$22.26	\$22.40		Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents	
No. 2, Valley furnace	18.50	19.00	20.00	20.50		Sheets, black, No. 28, Pgh	3.20	3.20	3.30	3.60	
No. 2, Southern, Cin'tif	24.05	24.05	24.05	25.05		Sheets, black, No. 28, Chi- cago dist. mill	3.40	3.40	3.50	3.60	
No. 2, Birmingham, Ala.	20.00	20.00	20.00	21.00		Sheets, galv., No. 28, Pgh	4.25	4.30	4.40	4.80	
No. 2 foundry, Chicago*	20.50	21.00	22.00	22.50		Sheets, galv., No. 28, Chi- cago dist. mill	4.50	4.50	4.60	4.80	
Basic, del'd, eastern Pa.	21.50	21.00	21.00	21.00		Sheets, blue, 9 & 10, Pgh	2.40	2.40	2.40	2.60	
Basic, Valley furnace	18.25	18.50	20.00	20.00		Sheets, blue, 9 & 10, Chi- cago dist. mill	2.50	2.50	2.50	2.60	
Valley Bessemer, del. Pgh	21.26	21.26	22.76	23.76		Wire nails, Pittsburgh	2.75	2.75	2.75	2.90	
Malleable, Chicago*	20.50	21.00	22.00	22.50		Wire nails, Chicago dist. mill	2.85	2.85	2.85	3.00	
Malleable, Valley	19.00	19.00	20.50	20.50		Plain wire, Pittsburgh	2.50	2.50	2.50	2.65	
Gray forge, Pittsburgh	19.76	20.26	21.26	21.76		Plain wire, Chicago dist. mill	2.60	2.60	2.60	2.70	
L. S. charcoal, Chicago	29.04	29.04	29.04	29.15		Barbed wire, galv., Pgh	3.45	3.45	3.45	3.70	
Ferromanganese, furnace	115.00	115.00	115.00	107.50		Barbed wire, galv., Chi- cago dist. mill	3.55	3.55	3.55	3.80	

Rails, Billets, etc., Per Gross Ton:		May 26, 1925	May 19, 1925	Apr. 28, 1925	May 27, 1924	Old Material, Per Gross Ton:		May 26, 1925	May 19, 1925	Apr. 28, 1925	May 27, 1924
O-h. rails, heavy, at mill	\$43.00	\$43.00	\$43.00	\$43.00		Carwheels, Chicago	\$16.25	\$16.00	\$16.00	\$16.50	
Bess. billets, Pittsburgh	35.00	35.00	35.50	38.00		Carwheels, Philadelphia	17.00	17.00	17.50	17.00	
O-h. billets, Pittsburgh	35.00	35.00	35.50	38.00		Heavy steel scrap, Pgh	17.00	17.00	16.50	16.50	
O-h. sheet bars, P'gh	35.00	35.00	37.00	40.00		Heavy steel scrap, Phila.	15.00	14.50	14.50	15.00	
Forging billets, base, Pgh	40.00	40.50	40.50	43.00		Heavy steel scrap, Ch'go.	15.50	15.00	14.75	13.75	
O-h. billets, Philadelphia	40.67	40.67	41.17	43.17		No. 1 cast, Pittsburgh	17.50	17.50	17.50	17.50	
Wire rods, Pittsburgh	46.00	46.00	46.00	48.00		No. 1 cast, Philadelphia	17.00	17.00	17.00	17.00	
	Cents	Cents	Cents	Cents		No. 1 cast, Ch'go (net ton)	17.50	17.00	17.00	17.00	
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	2.20		No. 1 RR. wrot, Phila.	17.50	17.50	17.50	16.50	
Light rails at mill	1.75	1.75	1.75	1.90		No. 1 RR. wrot. Ch'go (net)	14.00	13.50	13.00	11.75	

Finished Iron and Steel,		May 26, 1925	May 19, 1925	Apr. 28, 1925	May 27, 1924	Coke, Connellsville,		May 26, 1925	May 19, 1925	Apr. 28, 1925	May 27, 1924
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents	Cents	Per Net Ton at Oven:					
Iron bars, Philadelphia	2.22	2.22	2.22	2.47		Furnace coke, prompt	\$3.00	\$3.00	\$3.00	\$3.25	
Iron bars, Chicago	2.05	2.05	2.10	2.25		Foundry coke, prompt	4.00	4.00	4.00	4.50	
Steel bars, Pittsburgh	2.00	2.00	2.00	2.20							
Steel bars, Chicago	2.10	2.10	2.10	2.25							
Steel bars, New York	2.34	2.34	2.34	2.59							
Tank plates, Pittsburgh	2.00	2.00	2.00	2.20							
Tank plates, Chicago	2.20	2.20	2.20	2.40							
Tank plates, New York	2.24	2.24	2.34	2.34							
Beams, Pittsburgh	2.00	2.00	2.00	2.20							
Beams, Chicago	2.20	2.20	2.20	2.45							
Beams, New York	2.34	2.34	2.34	2.44							
Steel hoops, Pittsburgh	2.40	2.40	2.40	2.75							

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

THE IRON AGE Composite Prices

May 26, 1925, Finished Steel, 2.460c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

May 19, 1925, 2.460c.
April 28, 1925, 2.474c.
May 27, 1924, 2.624c.
10-year pre-war average, 1.689c.

May 26, 1925, Pig Iron, \$19.42 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

May 19, 1925, \$19.63
April 28, 1925, 20.71
May 27, 1924, 20.98
10-year pre-war average, 15.72

High	1923	1924	1925	1925	1924	1923
	2.824c, April 24	2.789c, Jan. 15	2.560c, Jan. 6	2.460c, May 5	2.460c, Oct. 14	2.446c, Jan. 2

orders to engage about 80 per cent of its capacity. There is a better demand for wire products and a satisfactory movement of hot rolled flats is noted. Sheets remain the most unsatisfactory division of the steel market, as there is no real stability to prices and buyers fear to buy heavily because of the danger of not getting the lowest possible price. Barge orders calling for more than 5500 tons of steel have come to a local fabricator and the Carnegie Steel Co. will furnish the steel.

The general average of blast furnace and steel works operations in this and nearby districts has not changed in the past week. This indicates that the adjustment of production to demand has been pretty well completed, but it also shows that demands are not yet

of sufficient volume to encourage larger operations. Strip prices have shown a further slight recession, more particularly in the maximum quotations and it is generally admitted that on cold-rolled strips 3.75c., base Pittsburgh, now measures the top and bottom of the market. On the major products a minimum of 2c., base Pittsburgh, is well maintained and other finished lines also are holding at recent prices, except for a slight revision in the size extras for the coarser gages of wire, which brings down the price \$1 to \$2 a ton.

As for market sentiment, it may be called fairly cheerful. It is a pretty general opinion that the excess of production over consumption in the first quarter of the year is being worked off steadily and that, if anything, steel is being used faster today than it is being

produced. Hopes for the future of the year are based chiefly on the belief that the railroads will be freer buyers of equipment than they have been and that the agricultural implement industry, in preparation for 1926, will place much tonnage for delivery in the last half.

The outlook for an increase in the demand for structural steel is not considered very bright, because there is so much on order against which shipping instructions still are deferred. Fluctuations in oil prices are so frequent that a forecast of the demand in that industry is rather difficult.

The pig iron market still is seeking a trading level and while business is better, it is not yet good. There is a good deal of firmness to the scrap market but the explanation seems to be chiefly in the fact that outside markets are paying higher prices than prevail here. It is difficult for producers of coke and coal to get the output down to the basis of current requirements, and consequently prices still are easy.

Pig Iron.—The effort of producers to interest consumers continues. Because prices are admittedly low, the present price of foundry grade being the lowest that it has been in this market since 1916, there has been some increase in sales. A very fair aggregate business has been done in foundry iron, although most of the sales individually have been small. On a portion of the business sellers have obtained \$19, Valley furnace for No. 2, but a good deal more has been moved at \$18.50, and on any worth-while tonnages it is doubtful if buyers now would be called on to pay more than the latter price. It is interesting to note that No. 2 Valley foundry iron in the depression did not get below \$19, while the low point in the early part of the following year was \$18.75, which has stood as a post war minimum until the past week. It is doubtful if any merchant producer has a cost low enough to warrant today's price, but costs do not always regulate selling prices. The market is low because the supply exceeds the demand. We note one sale of 1000 tons of basic iron at \$18.50, Valley furnace, and a sale of 3000 tons of this grade at \$18.25, putting the Valley market on this grade at \$18.25 to \$18.50. Sales of Bessemer have been entirely of small lots, at \$19.50, Valley furnace, and \$19, Valley furnace for malleable iron has been the basis. Small lots of low phosphorus iron are selling at \$29.51 to \$29.76, delivered Pittsburgh.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	.....	\$18.25 to \$18.50
Bessemer	.....	19.50
Gray forge	.....	18.00 to 18.50
No. 2 foundry	.....	18.50 to 19.00
No. 3 foundry	.....	18.00 to 18.50
Malleable	.....	19.00
Low phosphorus copper free	.....	27.75 to 28.00

Ferroalloys.—A stock of German ferromanganese at one of the Atlantic seaports, available at \$5 a ton below the price of domestic and British material, is supplying much of the current demand, which is entirely for small lots. American and British producers continue to quote \$115, Atlantic seaboard, but are making few sales, the German material getting the call, not only because of price, but because, as it is in the country, there are no doubts as to deliveries. New business in 50 per cent ferrosilicon is light and that also is the case with spiegeleisen. Scheduled prices of Bessemer ferrosilicon and silvery irons are being shaded by as much as \$1 a ton. Prices are given on page 1605.

Semi-Finished Steel.—Makers of billets, slabs and sheet bars in this district have followed the reductions recently made by Youngstown and Cleveland mills. The revision, however, applies chiefly on contract tonnages, because there is almost no new business and, so far as fresh sales are concerned, the lower quotations are just as nominal as were the former prices. Sheet bars usually sell at a premium over billets and slabs and, with sheet bars at \$35, there is doubt that billets and slabs now can be sold at that price. The price cut in sheet bars again demonstrates that the prices of sheets make the prices of sheet bars, rather than the reverse. Forging quality billets command the usual extra over rolling quality. Interest in skelp is low but there is a fairly active demand for wire rods. Prices are given on page 1605.

Wire Products.—Small lot orders continue to increase in number and, while this development has brought about no increase in plant operations, it encourages the belief that jobbers and manufacturers are making constant inroads upon their stocks. The price situation still is irregular. Observance of quotations is fairly rigid, but this does not mean absolute absence of price shading and local mills going outside their natural territories find competition keen. Coated nails are weak. We still place mill operations at about 50 per cent of capacity. Prices are given on page 1604.

Sheets.—The market has yet to achieve that price stability which many think will be productive of larger and more confident buying. In the past week the market has yielded further and 3.30c. for black, and 4.35c. for galvanized, now are regarded here as maximum prices, while minimum prices are \$2 a ton less, at 3.20c. for black and 4.25c. for galvanized. A number of makers still are anxious for as full mill operations as possible and are naming prices calculated to provide the necessary orders. With buyers cautious as a result of the constant decline in prices for several weeks, and signs lacking that bottom has been reached, purchases, though fairly numerous, run largely to small lots and for early delivery. It is not a satisfactory situation for the manufacturers, while jobbers, obliged to follow changes in mill bases, are dissatisfied. Mill operations still hold an average of about 65 per cent of capacity. Prices are given on page 1604.

Tin Plate.—Specifications still are coming in well and mills continue to find a satisfactory rate of engagement. The outlook for the packing crops still is good and evidently expectations as to tomatoes are high, since one company in a tomato-growing area, which recently indicated requirements for July and August of 150,000 to 200,000 boxes, late last week specified for 200,000 boxes for July delivery. There is a possibility of additional tonnage for August shipment. The weather still is a factor in the final outcome of the crops and, as it is recalled that wet weather a year ago made quite a difference in the final crop of tomatoes, there is no sign now of gaging production of tin plate by crop prospects. The price on domestic business is \$5.50 per base box, Pittsburgh, subject to the usual preferentials to large buyers, for standard cokes.

Cold-Finished Steel Bars and Shafting.—Specifications against contracts still are coming along in satisfactory volume, but little strictly new business. Contracts generally carry a price of 2.70c., base, Pittsburgh. Some large buyers probably enjoy a preferential price, but there are few steel products in which the large consumers do not. Prices are given on page 1604.

Bolts, Nuts and Rivets.—Business still drags in these lines. Buyers, impressed by the fact that capacity is large and that makers are anxious for business, are inclined to buy close to actual needs. There is no sign that this sort of demand is having much effect upon quotations; there is some shading, but it is an almost unknown condition for all makers to hold absolutely to quotations on all business. Prices and discounts are given on page 1605.

Steel and Iron Bars.—There is a fairly good demand for small tonnages of steel bars, with prices holding at the recent range. There seems to be no inclination on the part of mills here to go below 2c., although a sale of a fair-sized tonnage of high carbon spring steel bars is noted which figures back to 1.90c., base. The carbon extra, however, is fairly large, and it is possible that it was shaded rather than the base price. There is a steady movement of iron bars at unchanged prices. Prices are given on page 1604.

Structural Material.—Strictly new demand upon the mills is not running to very large tonnages, but there is close observance of the minimum price of 2c. on such business as is being presented, at least that originating in this territory. Structural shops here are finding it hard to maintain reasonably full operations because incoming business is not keeping pace with completed orders. The Westinghouse Electric & Mfg. Co. is expected to close shortly for 1400 tons of steel for an 11-story office building at East Pittsburgh. This

stands out as the most important prospect now before the local shops. Plain material prices are given on page 1604.

Plates.—The American Bridge Co. has taken orders for 32 barges which will require more than 5700 tons of steel, mostly plates. The week has not been productive of much other plate business of consequence. There is still a quotation of 2.10c., base, Pittsburgh, on plates, but it is still more of a hope than a realization. Prices are given on page 1604.

Rails and Track Supplies.—The market for light rails is so dull that an inquiry for as much as a car-load is something of an event. On billet rails, makers have a quotation of 1.75c., base, but business is lost as often as it is secured at that figure. Local makers of tie plates do not expect to participate in the inquiry of the Missouri Pacific Railroad for about 3500 tons, and also figure that the inquiry of the Atlantic Coast Line for 10,000 kegs of spikes will go to other districts. The nearby demand for standard spikes is slow, and there is practically no market at all for small spikes. Prices do not change much. They are given on page 1604.

Hot Rolled Flats.—There is a well sustained demand for the various products under this heading, particularly from the automotive industry and prices are firm. They are given on page 1604.

Cold Rolled Strips.—Prices above 3.75c., base Pittsburgh, except possibly for retail lots, have largely disappeared. The American Steel & Wire Co. is quoting 3.75c., base Cleveland, or Pittsburgh, and as that also is the price of some of the large independents, others find the effort to get more a futile one. There is a fair business and dissatisfaction among producers is largely on the score of price and the lack of profit.

Old Materials.—The market still exhibits strength, although it appears to be due more to the upward trend of outside markets than to local activity. Sales of heavy melting steel have been made as high as \$17.50 in the past week, but not much tonnage was moved, the buying being chiefly by a melter who had held up shipments against old and higher-priced orders and was anxious to get down the price average. Few dealers appear willing to sell round tonnages under \$18, but finding buyers willing to go that high is another matter. There is no pressure to sell scrap and the market derives some support from purchases by dealers, short against some delivery points which lately have opened, after having been closed by suspensions. Relatively higher prices now rule on steel works grades of scrap in other consuming centers, and much is made of that condition on account of its bearing on shipments to this market.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton		
Heavy melting steel.....	\$17.00 to \$17.50	
No. 1 cast, cupola size.....	17.50 to 18.00	
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.50 to 18.00	
Compressed sheet steel.....	16.00 to 16.50	
Bundled sheets, sides and ends.....	15.00 to 15.50	
Railroad knuckles and couplers.....	19.00 to 19.50	
Railroad coil and leaf springs.....	19.00 to 19.50	
Low phosphorus blooms and billets ends.....	22.00 to 22.50	
Low phosphorus plate and other material.....	21.00 to 21.50	
Railroad malleable.....	17.00 to 17.50	
Steel car axles.....	19.50 to 20.00	
Cast iron wheels.....	17.00 to 17.50	
Roiled steel wheels.....	19.00 to 19.50	
Machine shop turnings.....	13.00 to 13.50	
Short shoveling turnings.....	13.00 to 13.50	
Sheet bar crops.....	20.00 to 20.50	
Heavy steel axle turnings.....	16.50 to 17.00	
Short mixed borings and turnings.....	12.00 to 12.50	
Heavy breakable cast.....	14.50 to 15.00	
Stove plate.....	13.50 to 14.00	
Cast iron borings.....	14.00 to 14.50	
No. 1 railroad wrought.....	13.50 to 14.00	
No. 2 railroad wrought.....	17.00 to 17.50	

Coke and Coal.—The market on beehive oven furnace coke now is quotable at \$3 per net ton at ovens for either spot or third quarter shipment. A Valley furnace interest just closed for about 15,000 tons a month for third quarter at that figure and a Youngstown district steel company is understood to have so-

cured its coke requirements for that period at the same price. There is not as much business in sight for the third quarter as there was for the two preceding quarters because several furnaces have ceased production and by-product coke is finding greater use in furnaces that formerly ran on beehive coke. There are smaller offerings of spot furnace coke than a week ago but the demand is very limited and \$3 is not very readily obtained. Spot foundry coke still is quotable at \$4 to \$4.50 per net ton at ovens for the better brands of standard grade but unselected foundry coke can be bought for less than \$4. The supply of coal still is very ample for the demand and prices favor buyers. Prices are given on page 1605.

Preparing for Foreign Trade Convention at Seattle

The steel trade is represented on the program for the twelfth National Foreign Trade Convention to be held at Seattle, Wash., June 24 to 26 by President James A. Farrell of the United States Steel Corporation, and by President George G. Crawford of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Mr. Farrell, who has been chairman of the council for many years, will give an address at the opening session on the "Foreign Trade Outlook." Mr. Crawford will speak at the general session, Thursday, June 25, on "Possibilities of Future Trade." At one of the important group sessions, that of Thursday afternoon, which will consider the topic "Foreign Representation for Export," W. W. Nichols, New York, president American Manufacturers' Export Association, will preside. At the meeting of group 2, which will be devoted to trade with Japan, M. A. Oudin, vice-president International General Electric Co., Schenectady, N. Y., will act as chairman.

The Seattle meeting will be marked by the presence of a large delegation from the Orient, particularly from Japan, which will have a better representation than at any other foreign trade convention. Seattle sent a delegation across the Pacific in the interest of a large attendance from China and Japan.

SEATTLE, May 21.—The general committee of eleven prominent business men of the Pacific Coast which has in charge the entertainment of the delegates to the twelfth annual convention of the National Foreign Trade Council to be held here are frequently meeting.

William Pigott, vice-president Pacific Coast Steel Co., Seattle, is chairman of this committee. The other members include Robert Dollar, president, Robert Dollar & Co., San Francisco; C. Parker Holt, president Holt Mfg. Co., Stockton, and Fred L. Baker, president Baker Iron Works, Los Angeles.

Scrap Higher at Detroit

DETROIT, May 26.—The recent purchase by the Otis Steel Co. has further strengthened the market on old material and dealers appear to be feeling more optimistic. An increase of 50c. per ton has been registered on heavy melting and shoveling steel, 25c. on long turnings, \$1 on automobile cast and 50c. on hydraulic compressed and No. 1 bushelings. Sales of pig iron in the district show a good tonnage for third quarter and melters generally express the opinion that the bottom in this material has been reached. The melt in the district is at a high point for the year and promises to carry at this point for some time to come.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	\$13.50 to \$14.00
Borings and short turnings	10.25 to 10.75
Long turnings	10.00 to 10.50
No. 1 machinery cast	15.00 to 16.00
Automobile cast	21.00 to 22.00
Hydraulic compressed	11.75 to 12.25
Stove plate	14.50 to 15.50
No. 1 busheling	12.00 to 12.50
Sheet clippings	8.75 to 9.25
Flashings	10.50 to 11.00

Chicago

Pig Iron Active at Lower Prices—Quick Shipments Demanded in Steel

CHICAGO, May 26.—Pig iron continues to waver as buyers take more interest in the market and some sales have been made at further concessions of 50c. a ton. Finished steel prices cannot be described as strong but they are no weaker than heretofore. Nothing resembling a buying movement has developed but orders calling for quick shipment are more numerous, indicating that consumers' inventories are being reduced to a low level.

Among the consuming industries, the automobile manufacturers continue to operate at capacity. Farm equipment makers are not so busy as earlier in the spring, but promise to operate at a much better rate than is normally the case during the summer season. Mill specifications from reinforcing bar dealers have tapered off somewhat, but this trend may change abruptly if the large amount of pending work is placed. One prospective reinforcing project alone calls for 20,000 tons of bars.

Current awards of structural steel are light but business placed with the mills has improved, evidently reflecting past lettings. Local plate mills are in need of tonnage. The large car inquiries expected from various Western roads have not got beyond the rumor stage, but the St. Paul, which placed 5500 cars two weeks ago, is about to distribute orders for 1000 more, as well as for repairs on 2000 stock cars. Fully 7500 tons of oil storage tank work is pending, of which 4000 tons represents requirements of the Humble Oil Co. in Louisiana.

The steel output of the leading local producer has declined to 87 per cent of ingot capacity while the foremost independent remains on a 90 per cent basis. Production, however, is not evenly distributed among the various mills. Sheet and wire mill operations range from 60 to 65 per cent. Twenty-six steel works blast furnaces remain active out of the 35 in this district.

Pig Iron.—As interest in the market increases, prices are wavering and on some business as low as \$20.50, base local furnace, has been done. Inquiries are numerous, calling for both third quarter and last half deliveries. Among pending third quarter inquiries for foundry iron are 1000 tons for a local melter, 900 tons for a western Illinois user, 800 tons for a Chicago plant and 300 tons for a western Illinois destination. A local user is in the market for 1500 tons of foundry iron for last half and an Iowa melter for 600 tons of foundry for the same delivery. Two local sales of 1000 tons and 400 tons, respectively, call for third quarter shipment. A basic user has closed for 3000 tons, part of it off grade material. A local buyer has contracted for 5000 tons of basic for a St. Louis district plant. An Indiana melter has closed for 500 tons of Southern foundry at \$18, base Birmingham. Scattered carlot sales of charcoal iron have brought \$26, furnace. Deen concessions in silvery iron are disappearing, \$1 below the Jackson County schedule being about the most that is being done. Merchant furnace operations in this district are unchanged but the Thomas stack at Milwaukee, long idle, is expected to blow in the middle of June. If production is resumed, sales will be handled by Walter Wallingford & Co., Chicago.

Quotations on Northern foundry, high phosphorus, malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 6c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sll. 1.75 to 2.25	\$20.50 to \$21.00
Northern No. 1 foundry, sll. 2.25 to 2.75	21.00 to 21.50
Malleable, not over 2.25 sll.	20.50 to 21.00
Basic	20.50 to 21.00
High phosphorus	\$21.00
High Superior charcoal, averaging sll. 1.50, delivered at Chicago	29.04
Southern No. 2, sll. 1.75 to 2.25	24.01
Low phos., sll. 1 to 2 per cent, copper free	32.65
Silvery, sll. 8 per cent	31.29
Electric ferrosilicon, 14 to 16 per cent	43.42

Ferroalloys.—Spiegeleisen has shown further weakness on recent sales, as low as \$37.58, delivered, having been done. Sales of ferromanganese have been confined to small lots.

We quote 80 per cent ferromanganese, \$122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$37.58 to \$38.04, delivered.

Plates.—Local mills are in need of plate tonnage and are placing their hopes on additional railroad car buying, as well as oil storage tank construction. Pending inquiries for tanks aggregate 7500 tons.

The mill quotation is 2.20c., Chicago. Jobbers quote 3.10c. for plate out of stock.

Structural Material.—Current fabricating awards are light, but mill bookings in plain material are 50 per cent in excess of orders taken in the previous week, which in turn showed a gain over the week before. Neither orders nor specifications, however, are equal to shipments.

The mill quotation on plain material is 2.20c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bars.—Tonnage from the automobile and farm implement industries is still in good volume, although specifications from reinforcing bar dealers and bolt manufacturers have tapered off slightly. New orders for soft steel bars invariably call for quick shipment, indicating that purchases are being made to fill gaps in depleted inventories. Business in bar iron is in fair volume, and the Republic Rolling Mill Corporation will start single turn operations July 1 at its East Chicago plant, the former Republic Iron & Steel Co. mill. Rail steel bars are still held at 2.10c., mill, and the two plants at Chicago Heights are operating double turn. Considerable tonnage in reinforcing bars has been accumulated but demands from the implement and bed manufacturers have tapered off.

Mill prices are: Mild steel bars, 2.10c. to 2.20c.; common bar iron, 2.05c.; Chicago; rail steel, 2.10c.; Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and hexagons and 4.30c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c. to 2.70c.

Sheets.—Demand is light, but prices have shown no further weakness. Producers are no longer pressing so hard for tonnage at the expense of prices, because it has been fairly well demonstrated that concessions will not bring out the business.

Chicago delivered prices from mill are 3.45c. to 3.50c. for No. 28 black, 2.55c. to 2.60c. for No. 10 blue annealed and 4.55c. to 4.60c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Wire Products.—No real change in market conditions can be observed. Prices are still soft and both orders and specifications are relatively light. Cement coated nails are perhaps not quite so erratic as heretofore, \$2.10, Western mill, being a representative quotation. Mill operations do not exceed 65 per cent.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.05 for 100 lb.; common wire nails, \$3.15 per kg.; cement coated nails, \$2.45.

Rails and Track Supplies.—Railroad requirements in rails are now well taken care of in contracts already on mill books. Current activity is confined to orders for small lots of spikes, bolts, tie plates, and angle bars, representing nearby requirements.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. makers' mill.

Standard railroad spikes, 2.90c. to 3c. mill; track plates, 2.35c., f.o.b. mill; angle bars, 2.75c. f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts, 4.55c. base.

Bolts, Nuts and Rivets.—Concessions in bolt and nut discounts are still being made on attractive business, but a leading producer will open books next week for third quarter at unchanged prices. With buyers limiting both orders and specifications to spot needs, it is a question to what extent contracting will go ahead. A

considerable number of buyers did not contract for their second quarter requirements, preferring to buy from time to time on the open market. Bolts and nuts, however, have been steadier than rivets. The quotations of 70 and 10 off, Chicago, on small rivets, and \$2.75 on large rivets are weak. Bolt and nut plant operations do not exceed 70 per cent.

Jobbers quote structural rivets, 35c.; boiler rivets, 37c.; machine bolts up to $\frac{1}{2}$ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{1}{2}$ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squares, tapped or blank, \$3.50 off; hot-pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

Cast-Iron Pipe.—Detroit, which furnished the last severe test of prices, is again in the market, this time for over 14,000 tons. Bids will be received May 29 on 2100 tons of 6-in., class B; 3010 tons of 8-in., class B; 2950 tons of 12-in., class C; 2650 tons of 16-in., and 3538 tons of 24-in. Meanwhile prices on current lettings indicate a recovery of strength, ranging from \$39.50 to \$40, base Birmingham, on 6-in. and larger. Dayton, Ohio, has not yet closed on 414 tons of 10- to 24-in., on which it received tenders May 22.

We quote per net ton, f.o.b. Chicago, as follows:
Water pipe, 4-in., \$51.70 to \$52.20; 6-in. and over, \$47.70 to \$48.20; Class A and gas pipe, \$4 extra.

Old Material.—The market is largely in the hands of dealers who have bid prices up from 25c. to \$1 a ton. Consumer interest has been manifested by an increasing number of inquiries for small tonnages, but as yet there is a general reluctance to pay the figures which are now being asked. There is a wide difference in interpretations of the present situation. By some it is felt that brokers are driving prices up in the hope of making sales which later may be filled at a profit when the market reacts to lower levels. Others believe that scrap is anticipating a general improvement in the business of consuming industries. Railroad lists include the Burlington, 5900 tons, and the Grand Trunk, 2200 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	\$16.00 to \$16.50
Cast iron car wheels	16.25 to 16.75
Relaying rails, 56 and 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	19.25 to 19.75
Railroad tires, charging box size	19.00 to 19.50
Railroad leaf springs, cut apart	19.00 to 19.50
Rails for rolling	17.50 to 18.00
Steel rails, less than 3 ft.	18.00 to 18.50
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	16.00 to 16.50
Shoveling steel	15.00 to 15.50
Drop forge flashings	11.50 to 12.00
Hydraulic compressed sheets	13.00 to 13.50
Axle turnings	13.50 to 14.00
Steel angle bars	17.00 to 17.50
Steel knuckles and couplers	18.00 to 18.50
Coil springs	19.00 to 19.50
Low phos. punchings	16.50 to 17.00
Machine shop turnings	8.50 to 9.00
Cast borings	10.50 to 11.00
Short shoveling turnings	10.50 to 11.00
Railroad malleable	18.00 to 18.50
Agricultural malleable	17.00 to 17.50

Per Net Ton

Iron angle and splice bars	16.00 to 16.50
Iron arch bars and transoms	19.50 to 20.00
Iron car axles	26.00 to 26.50
Steel car axles	17.50 to 18.00
No. 1 busheling	11.50 to 12.00
No. 2 busheling	8.50 to 9.00
Pipes and flues	10.50 to 11.00
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	13.75 to 14.25
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	15.50 to 16.00
No. 1 agricultural cast	15.50 to 16.00
Locomotive tires, smooth	16.00 to 16.50
Stove plate	14.00 to 14.50
Grate bars	14.00 to 14.50
Brake shoes	13.75 to 14.25

Reinforcing Bars.—Awards of concrete bars have been relatively light, but considerable pending work is at the point of closing. The steel for the Stevens Hotel, Chicago, 1600 tons, is expected to be placed at any time. Two new sections in the South Water Street double-decking project, Chicago, will require 550 tons. Lettings include:

Alder Street pumping station, East Chicago, Ind., 105 tons, to Kalman Steel Co.

Addition to Y. M. C. A. college, Ingleside Avenue and

Thirty-third Street, Chicago, 100 tons of rail steel, to Calumet Steel Co.

Kroger warehouse, Detroit, 250 tons, to McRae Steel Co. Well furniture building and show room, Detroit, 150 tons, to McRae Steel Co.

Pending work includes:

Sections 4 and 5A, South Water Street double-decking project, Chicago, 550 tons, general contract awarded to Mid-Continent Construction Co.

Methodist Book Concern, building, Chicago, 275 tons of rail steel, general contract awarded to Mutual Construction Co.

State Bank & Trust Co., Evanston, Ill., 250 tons, Childs & Smith, Chicago, architects.

National Kindergarten College building, Wilmette, Ill., 125 tons, revised bids being taken.

Bittersweet Breakers, apartment hotel, 712 Bittersweet Place, Chicago, 165 tons.

Addition to Crawford Street station, Commonwealth Edison Co., Chicago, 100 tons.

American Can Co. building, Forty-seventh Street and Clybourn Avenue, Chicago, 100 tons.

McKINNEY STEEL CO.

Reorganization Follows Acquiring of Control by Corrigan Interests

James W. Corrigan was elected president of the McKinney Steel Co., Cleveland, at a meeting of the directors May 20, succeeding Price McKinney, who resigned after being connected with the company and its predecessor, Corrigan, McKinney & Co., for about 30 years. The new president is a son of the late James W. Corrigan, who with Stevenson Burke founded in 1896 the business which in 1916 was taken over by the McKinney Steel Co. Mr. Corrigan has been vice-president of the company but has not been active in its management and for the past few years has spent most of his time abroad. Mr. McKinney will continue as a member of the board of directors.

In the reorganization John H. Watson, Jr., who has been one of the directors for about five years, becomes secretary. J. E. Ferris, who has been secretary and treasurer, continues as treasurer. Henry T. Harrison, Donald B. Gillies, Henry W. Haggerty and J. E. Ferris were elected as vice-presidents. The new board of directors consists of James W. Corrigan, J. R. Nutt, H. R. Johnson, W. B. Turner, D. C. Shepard, Jr., Price McKinney, J. E. Ferris, Donald B. Gillies, Leland Ross and J. H. Watson, Jr.

The organization of the McKinney Steel Holding Co., which was formed to control the McKinney Steel Co. through stock ownership, as announced last week, was a preliminary step in the reorganization. James W. Corrigan has been the largest stockholder, owning 40 per cent of the stock, and Price McKinney the second largest but neither had voting control of the company. Mr. Corrigan bought the 13 1/2 per cent of interest in the company owned by E. S. Burke, Jr., a grandson of Stevenson Burke. This purchase gave Mr. Corrigan 53 1/2 per cent of the stock and to finance the purchase of the Burke stock he organized the holding company and placed \$7,250,000 in preferred stock of that company on the market.

With the new financing Mr. Corrigan controls both the holding company and the steel company. The company has announced that it will continue its past policy and consider no consolidation with any other steel interest.

The property of the McKinney Steel Co. includes four blast furnaces, a steel plant with 14 open-hearth furnaces and a by-product coke plant in Cleveland, three blast furnaces in New York and Pennsylvania and iron ore properties and coal mines. At present finishing mills are under construction in Cleveland. The balance sheet of the company Dec. 31 last showed net current assets of \$8,804,754 and net tangible assets of \$65,566,882.

The Southern Supply and Machinery Dealers Association has decided not to change its name, though there was a recommendation to substitute the word distributors for the word dealers.

New York

Large Companies in the Market for Pig Iron—Good Steel Specifications

NEW YORK, May 26.—There are indications of interest in pig iron purchases by a number of large companies and it is believed that in some cases negotiations have been concluded without general bidding. The sales through local offices were upward of 15,000 tons in the past week, as against 25,000 tons in each of the two preceding weeks. The General Electric Co.'s purchases for five plants amounted to about 3000 tons, including 500 tons of special iron. Further buying is expected. There is a good deal of interest in the buying said to be under way for a radiator company. A large consumer which has plants in the West and one important plant in the East is reported to be in the market for about 30,000 tons of foundry iron. A New Jersey foundry which was in the market last week has closed for about 1000 tons. A quantity of basic iron has been bought for a New England plant, 6000 to 7000 tons coming from Buffalo. A number of inquiries for special iron have been made in this district and eastern Pennsylvania. Buffalo and eastern Pennsylvania sellers have been paying rather more attention to silicon differentials in recent transactions. Stocks of pig iron in the Buffalo district are reported to be lessening under the lower rate of furnace operation. In general, operations of foundries in the Metropolitan and New Jersey districts are quite well maintained, though there is no noticeable increase due to seasonal work. Prices in ordinary transactions are on a \$19 Buffalo basis, while the eastern Pennsylvania ranges \$20 to \$20.50.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	\$22.52 to \$23.02
East. Pa. No. 1X fdy, sil. 2.75 to 3.25	23.02 to 23.52
East. Pa. No. 2X fdy, sil. 2.25 to 2.75	22.52 to 23.02
Buffalo, sil. 1.75 to 2.25	23.91 to 24.41
No. 2 Virginia, sil. 1.75 to 2.25	28.44

Ferroalloys.—The first inquiry of any proportion for ferromanganese for delivery in the last half is for 1000 to 1500 tons. Inquiries and sales for carload and small lots continue but the volume is not large. New business in spiegeleisen is confined to carload and small lots for early delivery. Specifications on contract for both alloys is fairly satisfactory.

Cast Iron Pipe.—Prices on bell and spigot pipe are still somewhat erratic, depending largely upon the presence of foreign competition for any specific business. No large municipal inquiries are reported current, but the City of New York is believed to be preparing to ask for bids on a sizable tonnage. A contract recently awarded to John A. Gregory Contracting Co., New York, by the Department of Water Supply, Gas and Electricity, requires the contractor to furnish about 500 tons of 20-in. pipe. The soil pipe market continues in the unstable condition of the past month or more, with a wide range of discounts quoted. As high as 50 per cent off on light and 60 per cent off on heavy pipe are reported to have taken business, but 48 1/4 on light and 58 1/4 off on heavy is nearer the average quotation of most makers. Only a fair volume of business is reported coming out despite the concessions in price.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$51.60; 4-in. and 5-in., \$55.60 to \$56.60; 3-in., \$65.60 to \$66.60, with \$5 additional for Class A and gas pipe. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 45% to 48 1/4 per cent off list; heavy, 55% to 58 1/4 per cent off list.

Finished Iron and Steel.—The tonnage coming in on contracts far exceeds that on new orders but there is nothing outstanding in the week's developments, except possibly the continuance of a fairly good volume of structural steel work. Prices remain pretty much at last week's levels and there is more resistance among steel companies to the pressure of some buyers for reductions. Plates have held during the week at 1.90c., Pittsburgh basis, bars at 2c. and structural shapes at

2c., except on some orders for shapes on which there are concessions of \$2 to \$3 a ton, depending upon the mill. Cold finished steel has been selling at 2.60c., Pittsburgh, on occasion, but 2.70c. still holds on a portion of current business. Sheet prices continue irregular, but apparently are no lower. There is fairly good demand for blue annealed, inquiries including one for 300 tons and two others of 200 tons each. Three makers of hot rolled strip steel have asserted to buyers that they will go no lower than 2.20c., Pittsburgh, on sizes wider than 6 in. and no lower than 2.40c. on the narrower sizes. It appears that slight concessions in prices on some products have been made under the guise of sales for re-export, and the usual export prices have been granted.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c.; plates, 2.24c. to 2.34c.; structural shapes, 2.24c. to 2.34c.

Warehouse Business.—Buying is limited, though slightly improved over previous weeks. There was a good demand for shafting and screw stock, reinforcing bars and structural materials, all of which are holding to quoted prices. Black and galvanized sheets were particularly weak; demand showed no gain, even after the reduction in prices of \$5 per ton three weeks ago. Competition is vigorous and prices are shaded in sheets, welded pipe and other lines. Non-ferrous groups displayed a firming tendency. Bar and pig tin were marked up 2c. to 3c. and lead is higher. We quote boiler tubes per 100 ft. as follows:

Lapwelded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Coke.—Inquiry for furnace coke is almost absent. Available spot lots are believed small and bring around \$3 per net ton at oven, the figure at which the 12,000 tons monthly for the last quarter is said to have been placed for the Sharon Steel Hoop Co. Foundry coke is on a different schedule. Several operators make nearly double their contract requirements and trust to open market buying to absorb half of the output. In consequence the poorer grades may be had at as low as \$3.50. On the whole current shipments run about even with output. We quote by-product coke at \$10.41, Newark or Jersey City.

Old Material.—While the market continues unchanged, brokers are showing more activity in covering low priced contracts, and dealers are, whenever possible, holding stocks for a higher market. A Claymont, Del., consumer recently bought heavy melting steel at \$15.50 per ton, but the total tonnage was not large and shipments on this contract are evidently being made from points in eastern Pennsylvania. Machine shop turnings are being purchased by brokers at \$12 per ton, delivered Harrisburg, and \$12.50, delivered Phoenixville. Specification pipe is stronger as a result of brokers' covering on contracts. Pipe is being purchased at \$15, delivered Lebanon, Pa., and in one instance a broker is paying as high as \$15.50 per ton, delivered Lebanon. Stove plate is quiet with shipments going forward to eastern Pennsylvania consumers at about \$13 per ton, delivered, and to a New Jersey consumer with a \$2.02 freight rate at \$13 per ton.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	.....	\$10.00 to \$10.50
Heavy melting steel, railroad or equivalent	.....

Rails for rolling	.....	11.00 to 11.75
Relaying rails, nominal	.....	12.25 to 12.75
Steel car axles	.....	21.00 to 22.00
Iron car axles	.....	17.50 to 18.00
No. 1 railroad wrought	.....	22.50 to 23.00
Forge fire	.....	12.50 to 13.00
No. 1 yard wrought, long	.....	9.50 to 10.00
Cast borings (steel mill)	.....	12.00 to 12.50
Cast borings (chemical)	.....	8.00 to 8.50
Machine shop turnings	.....	13.00 to 13.50
Mixed borings and turnings	.....	8.00 to 8.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	.....	8.00 to 9.00

Stove plate	.....	11.25 to 11.75
Locomotive grate bars	.....	9.25 to 11.00
Malleable cast (railroad)	.....	10.50 to 11.00
Cast iron car wheels	.....	13.00 to 13.50
No. 1 heavy breakable cast	.....	12.00 to 12.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	\$15.00 to \$15.50
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No. 1 heavy cast (columns, building material, etc.)	13.00 to 13.50
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No. 2 cast (radiators, cast boil-	12.00 to 12.50
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ers, etc.)	12.00 to 12.50
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Boston

Buffalo and Indian Pig Iron Figure in Sales—Scrap Market Steadier

BOSTON, May 26.—Activity in the pig iron market centers in Buffalo district and Indian furnace products. Sales are running considerably less than heretofore, the peak in the so-called buying movement evidently having been passed. Only one sizable tonnage was sold the past week, 2000 tons Indian, silicon 2.50 to 3 per cent. No sizable open inquiries are in the market. One local house is negotiating with a foundry for 700 tons and with another for 750 tons, in one instance high silicon and in the other low. Buffalo furnaces quote second-quarter iron at \$19 furnace base and third-quarter at \$19.50, but during the past week waived differentials on No. 2X iron on lots as small as 100 tons. The Buffalo iron market therefore cannot be considered firmer. Indian iron is offered on a basis of about \$20 on dock here duty paid, the delivered price usually being slightly under the Buffalo. The market for eastern Pennsylvania iron is largely nominal. While Virginia iron is quoted as low as \$22.75 base in other territories, sales were made here the past week at \$24 furnace base. Alabama furnaces, so far as New England is concerned, are sticking to \$22 base. During the past week 1688 tons Indian iron were received at this port, bringing the total importations for the month to date up to 3570 tons, contrasted with 3809 tons to the same time last month and 6768 tons to the same time in March. It is now reported that a Massachusetts radiator manufacturer who recently bought 8000 tons No. 2 plain for third quarter obtained the iron from a Buffalo steel mill at \$18.25 a ton on cars, shipping point.

We quote delivery prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$24.65
East. Penn., sil. 2.25 to 2.75.....	25.15
Buffalo, sil. 1.75 to 2.25.....	23.91 to 24.91
Buffalo, sil. 2.25 to 2.75.....	23.91 to 25.40
Virginia, sil. 1.75 to 2.25.....	29.92
Virginia, sil. 2.25 to 2.75.....	30.42
Alabama, sil. 1.75 to 2.25.....	31.60
Alabama, sil. 2.25 to 2.75.....	32.10

Shapes and Plates.—Mills openly quote 2.10c. on cars, shipping point, for shapes, but are accepting business at 2c. Plates at 2c. on cars shipping point apparently is a thing of the past, as current business is being done at 1.90c. The demand for both plates and shapes is of a hand-to-mouth character. Most of the fabricating jobs coming on the market involve small tonnages. Competition among fabricators for business is keen and prices at the low point of the year. The University of Maine has abandoned the erection of a new gymnasium calling for 280 tons of structural steel.

Cast Iron Pipe.—The Metropolitan District Commission, Boston, has awarded a contract to the George M. Byrne Construction Co., Boston, to construct a new water supply line, and the construction company has ordered 1650 tons 48-in. pipe from the Warren Foundry & Pipe Co. for the job. North Attleboro, Mass., has awarded approximately 500 tons of 6-in. and 8-in. pipe to the United States Cast Iron Pipe & Foundry Co. No other New England municipalities are now in the open market for pipe. Revised cast iron pipe prices follow: 4-in., \$61.10 a ton delivered common Boston freight rate points: 6-in. and larger, \$66.10. The usual \$5 differential on Class A and gas pipe is asked.

Coke.—Virtually all New England foundries have contracted for last-half coke requirements on a price ruling date of shipment or sliding scale basis. Current consumption of by-product foundry coke is just about holding its own, although the general melt of pig iron in this territory is reported as running slightly in excess of April. Some of the large industrial plants operating foundries have been obliged to let out work, and jobbing foundries as a rule are getting more business, but at the expense of prices. Both the New England Coal & Coke Co. and the Providence Gas Co. are doing current business on the basis of \$11.50 a ton delivered in New England.

Old Material.—Sales of scrap appear on the increase and prices are steadier. Business is far from brisk, however, and any improvement in prices has been slight. Now that prices are firmer, dealers are less inclined to sell. Current activity is confined largely to heavy melting steel, machine shop turnings, forged scrap and bundled skeleton, with occasional lots of forged flashings, chemical borings and pipe. Most of the melting steel moving is for a Bridgeport, Conn., plant. This week a barge load will be shipped to that city. New England foundries continue to pick away at No. 1 machinery cast at around \$18.50 a ton delivered and at textile cast at \$19.50, \$20 and \$20.50. The Boston & Maine Railroad yesterday closed bids on approximately 85 cars of miscellaneous material and the local Navy Yard on a round lot of boiler material. Today the Boston Elevated Railway will close bids on 1250 tons of material, including 700 tons of girder rails.

The following prices are for gross ton lots delivered consuming points:

Textile cast	\$19.50 to \$20.50
No 1 machinery cast.....	18.50 to 19.00
No. 2 machinery cast.....	15.50 to 16.00
Stove plates	13.00 to 13.50
Railroad malleable	19.00 to 20.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$10.50 to \$11.00
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	12.00 to 12.50
Wrought pipe (1-in. in diam., over 2 ft. long)	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Cast iron borings, chemical	10.00 to 10.50
Cast iron borings, rolling mill.....	8.00 to 8.25
Blast furnace borings and turnings	6.50 to 7.00
Forged scrap	9.00 to 9.50
Bundled skeleton, long	7.00 to 7.50
Bundled skeleton, short	9.00 to 9.50
Forged flashings	9.00 to 9.50
Shaftings	16.50 to 17.00
Street car axles	16.50 to 17.00
Rails for rerolling	11.50 to 12.00
Scrap rails	10.50 to 11.00

Buffalo

Fair Pig Iron Inquiry—Reinforcing Bars More Active

BUFFALO, May 26.—New inquiry for the week has covered about 6000 tons and in addition there has been some quiet purchasing through special negotiation. Two local makers took a total of 13,500 tons, the other makers not being so active. Central Foundry sought 2000 to 4000 tons. A melter from the eastern part of the State sought 1200 tons of malleable and there was another inquiry for 1000 tons of malleable. Among the bookings of one furnace was a 1500-ton lot of foundry, which may have been part of a larger inquiry. The market is firming toward \$19 with preponderance of the business of the week placed at this price. Business offered at \$18.50 by melters has been turned down by furnaces the latter part of the week. Operation is the same.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$19.00
No. 2X foundry, sil. 2.25 to 2.75.....	\$19.00 to 19.50
No. 1 foundry, sil. 2.75 to 3.25.....	19.50 to 20.50
Malleable, sil. up to 2.25.....	19.00
Basic	19.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—The situation is described by mill representatives as being a little better. Efforts are made to get 2.365c. on bars, but more frequently 2.265c. is taken and it is the same with shapes. Ruling sheet price is 3.565c. delivered Buffalo for black and 4.565c. delivered Buffalo for galvanized. Reinforcing bar business shows some improvement. A 20-story bank building in Erie, Pa., will require a sizable tonnage. About 500 tons of reinforcing material for the construction of western New York roads is up for bidding. The price is 2.265c. Buffalo for mill material and 2.75c. for stock. Mill operation is 65 per cent with two large plants. A reinforcing bar fabricating plant is on 75 per cent operation and a wire mill is on full

time, double shift, with three out of four open-hearth furnaces on.

Warehouse prices are being quoted as follows: Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.35c.; No. 10 blue annealed sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.80c.; cold rolled shapes, 4.65c.; cold rolled rounds, 4.20c.; wire nails, 4.00c.; black wire, 4.05c.

Old Material.—The only activity in the market just now is on the part of dealers who have old orders to complete before June 1, and who will pay as high as \$17 for heavy melting steel. Only small tonnages are moving at this price, because only small tonnages are required to fill out previous commitments. A little better sentiment prevails outside, possibly due to the same activity by dealers. The two larger mills of the district are not actively in the market and the reported prospective purchasing on the part of one has failed to come through. Stove plate is active, with \$14.50 being paid and 100 tons a large order. One local mill will pay \$15 for No. 1 busheling and hydraulic compressed, and might pick up a tonnage of heavy melting steel if this could be acquired at \$16. Specialties are dull, with an occasional car of knuckles and couplers moving.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	\$16.00 to \$16.50
Low phosphorus	18.50 to 19.50
No. 1 railroad wrought	14.00 to 14.50
Car wheels	15.00 to 16.00
Machine shop turnings	10.00 to 10.50
Cast iron borings	10.00 to 10.50
No. 1 busheling	15.50 to 16.00
Stove plate	14.25 to 14.50
Grate bars	12.50 to 13.00
Bundled sheets	11.50 to 12.00
Hydraulic compressed	14.50 to 15.50
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	17.00 to 17.50
No. 1 cast scrap	16.50 to 17.00
Iron axles	26.00 to 27.00
Steel axles	17.00 to 17.50

St. Louis

Marked Pig Iron Activity—New Reinforcing Bar Business

ST. LOUIS, May 26.—Buying of pig iron in this district was more active during the last week than for any time within the last few months. The St. Louis Coke & Iron Co. sold about 20,000 tons, of which 15,000 tons were basic, the principal transaction being 5000 tons to an Illinois melter and 5000 tons of foundry in lots of from 100 to 500 tons. The basic was sold for both prompt and third quarter delivery, while the foundry iron was for third quarter shipment. In addition, inquiries are pending for from 3000 to 5000 tons of foundry grades, the largest being for several thousand tons for an Indiana melter. The placing of future business is seen as an indication that melters are satisfied that the market has about reached the low level. The St. Louis Coke & Iron Co. is quoting \$20.50 to \$21, Granite City. While Northern iron is quoted nominally at \$21, Chicago, it is understood that sales were made in this market on the basis of \$19, Chicago. The Southern market ranges from \$18 to \$22, Birmingham, the latter figure being quoted by an independent producer whose output is being largely taken care of by pipe manufacturers in the South and is therefore not interested in this market at the present low prices.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, \$2.16 freight from Chicago, \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City.

Northern fdy., sil. 1.75 to 2.25...	\$23.16
Northern malleable, sil. 1.75 to 2.25	23.16
Basic	23.16
Alabama fdy., sil. 1.75 to 2.25 (rail)	\$23.17 to 27.17
Granite City iron, sil. 1.75 to 2.25	21.31 to 21.81

Finished Iron and Steel.—New reinforcing bar jobs of interest to the trade here are a seawall at Gulfport, Miss., requiring 3000 tons, general contract for which will be let on May 29, and 400 tons for the Wabash grain elevator at Kansas City, Mo. Reports from the mid-continent oil fields are that only a fair amount of business is being done, and supply houses and fabrica-

tors are complaining that competition is so keen that prices are very unsatisfactory. Warehouses and manufacturers of steel products are doing only a small volume of business.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.80c.; galvanized sheets, No. 28, 5.80c.; blank corrugated sheets, 4.95c.; galvanized, 5.95c.; cold-rolled rounds, shafting and screw stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{1}{8}$ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

Coke.—The by-product coke ovens report a fairly good demand for foundry grades, but this is due to their cutting in on business that formerly went to Connellsville and other sections. More contracts are being reported for domestic grades, but this means little as no shipping specifications have been issued.

Old Material.—Prices for old material are unchanged. The consumers of the district are buying very little and give no indication as to when they will be in the market. The railroads have sensed the low price situation and are offering very little material to the dealers. New lists follow: Chicago, Burlington & Quincy, 6000 tons; Missouri Pacific, 1500 tons; St. Louis & San Francisco, 1200 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$12.00 to \$12.50
Rails for rolling	16.00 to 16.50
Steel rails less than 3 ft.	17.00 to 17.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	30.00 to 30.50
Cast iron car wheels	15.50 to 16.00
Heavy melting steel	14.00 to 14.50
Heavy shoveling steel	14.00 to 14.50
Frogs, switches and guards cut apart	14.50 to 15.00
Railroad springs	17.50 to 18.00
Heavy axles and tire turnings	11.25 to 11.75
No. 1 locomotive tires	16.50 to 17.00

Per Net Ton	
Steel angle bars	13.50 to 14.00
Steel car axles	15.50 to 16.00
Iron car axles	24.00 to 24.50
Wrought iron bars and transoms	18.00 to 18.50
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	12.50 to 13.00
Cast iron borings	10.00 to 10.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad cast	15.00 to 15.50
No. 1 machinery cast	17.50 to 18.00
Railroad malleable	12.75 to 13.25
Machine shop turnings	7.00 to 7.50
Champion bundled sheets	8.00 to 8.50

Birmingham

Cast Iron Pipe the Feature—Pig Iron Buying Rather Slow

BIRMINGHAM, May 26.—The Southern pig iron market continues slow. The price base is apparently unchanged, and consumers are still buying in small lots. Several small-lot orders have recently been received in this district for shipment outside of the territory, into the Middle West, but the aggregate of that business has not been sufficient to absorb the 20 per cent of the make that ordinarily leaves this territory. Stove manufacturers are open in statements that Southern irons meet their needs with more satisfaction, but their purchases so far have been comparatively light, despite the fact that indications point to an earlier revival of the activity in this line. Improved conditions are anticipated in other directions. Furnace interests maintain the \$22 per ton base price on No. 2 foundry. Current reports of a \$20 per ton base are not here verified. Larger melters of iron have a little stock on their own yards. Unfilled tonnages with furnace companies has been on a steady decline for some time. Fifteen blast furnaces are producing foundry iron and nine are on basic. The need for basic iron is greater now, with new open-hearth furnaces of the Tennessee Coal, Iron & Railroad Co. in operation. All inquiries being received now indicate a call for concessions on quotations,

but an offer of a buyer to take on 2000 tons at a \$3 reduction on present base has not been taken up.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 srl.	\$20.00
No. 1 foundry, 2.25 to 2.75 srl.	20.50
Basic	20.00
Charcoal, warm blast	30.00

Finished Steel.—Plants of the Steel Corporation subsidiary in this district are still operating to near capacity. Three of the six open-hearth furnaces of the Gulf States Steel Co. are active and two of the four open-hearth furnaces of the Tennessee Coal, Iron & Railroad Co. at Fairfield, with the remainder expected to be making steel by the end of the month. The Gulf States company has started work on a new bar mill. Soft steel is on a 2.15c. to 2.25c. base, Birmingham.

Cast Iron Pipe.—Steady production and shipment of product as quickly as produced is still the condition of cast iron pressure pipe market in this district. Total pipe being sold is considerable. Quotations are given at \$40 per ton, 6-in. and over, but weak. The present year already presents aggregate business as good as 1924, despite competition of foreign-made pipe.

Coke.—Independent coke producers are selling foundry coke at \$5 per ton and demand is fairly good, with production steady. Furnace coke is 50c. to \$1 less and by-product coke plants are all going well. The rebuilding of 40 ovens of Woodward Iron Co. by-product plant is about finished and will be back in operation within 30 days. Progress is reported by the Yolande Coal & Coke Co. on Connellsburg shaft.

Old Material.—The market in the South is still lagging, though more or less old material is moving steadily. Tennessee Coal, Iron & Railroad Co., which stepped into the open market recently and purchased liberally, has ceased negotiations for the time being. It is believed that this purchasing is not completed. Dealers are keeping stocks well up, confident of steady business.

We quote per gross ton, f.o.b. Birmingham, district yards, as follows:

Cast iron borings, chemical	\$15.00 to \$16.00
Heavy melting steel	12.00 to 14.00
Railroad wrought	12.00 to 13.00
Steel axles	17.00 to 18.00
Iron axles	18.00 to 19.00
Steel rails	13.00 to 14.00
No. 1 cast	16.50 to 17.00
Tramcar wheels	16.50 to 17.00
Car wheels	15.00 to 16.00
Stove plate	13.00 to 14.00
Machine shop turnings	7.00 to 8.00
Cast iron borings	8.00 to 9.00
Rails for rolling	16.50 to 17.00

San Francisco

Price Weakness Continues—Buying Lessens—Inquiries Small

SAN FRANCISCO, May 23 (By Air Mail).—Although buying was moderately active during the past week, and in some respects equal to that of the two preceding weeks, it was unaccompanied by new inquiries of consequence. Price weakness continues in nearly all markets. Outstanding among the developments of the week was the placing of 4700 tons of reinforcing bars for the Oakland-Alameda estuary tube, which was divided among the three local mills—Columbia Steel Corporation, Pacific Coast Steel Co. and Judson Mfg. Co. The price has not been announced but, as Eastern mills quote a delivered price of 2.50c., c.i.f. Coast ports, for desirable tonnages, it is generally presumed that the local mills bid in competition with Eastern quotations.

A local fabricator recently secured a contract for five gold dredges from the Russian Soviet Government, and has placed 150 gross tons of forging billets with an Eastern mill. This includes the inquiry for 80 tons reported two weeks ago.

The United States Steel Products Co. will furnish the 6000 tons of plates required for the Vancouver, B. C., pipe line, which will be fabricated by the Vancouver Engineering Works. It is understood that the contract was taken on an export basis, in competition

with English bids, at 2.20c., c.i.f. delivered in Vancouver.

Pig Iron.—Interest is quiet, and prices are unchanged with the exception of Birmingham, Ala., foundry iron, which is now being quoted \$29 to \$30 delivered, instead of \$31. Small consistent sales of Utah iron continue at \$27.50 delivered.

*Utah basic	\$27.25 to \$28.25
*Utah foundry, srl. 1.75 to 2.25	27.50 to 28.50
**Scot foundry	28.00 to 30.00
**English foundry	27.00 to 28.00
**Belgian foundry	26.00
**Dutch foundry	25.25 to 26.50
**Indian foundry	26.50
**German foundry	26.50
*Birmingham, Ala., foundry, srl.	29.00 to 30.00
2.75 to 3.25	

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Shapes.—Awards for the week totaled 2700 tons. The Emsco Steel Products Co., Los Angeles, placed 1800 tons of light angles for stock with the Columbia Steel Corporation, which is in addition to the 1200 tons of shapes placed with an Eastern mill a week ago. The American Bridge Co. took 900 tons for four transmission towers at Antioch, Cal., for the Pacific Gas & Electric Co. Quotations remain at 2.45c. to 2.50c., c.i.f. Coast ports, although better than 2.45c. is regarded as possible for desirable tonnages. No fresh inquiries calling for 100 tons or more have come into the market. A minimum quotation of 2.05c., duty paid, c.i.f. Coast ports, has been made for a large tonnage in foreign material, although 2.20c. is general in foreign shapes.

Plates.—About 7300 tons was placed during the week, which includes the 6000 tons for the Vancouver, B. C., pipe line taken by the Vancouver Engineering Works. Fresh inquiries call for only 450 tons. Prices are weak at 2.40c., c.i.f. Coast ports, although some of the Eastern mills are still quoting 2.50c. Bids have been canceled for the Chelan Reclamation District pipeline job, Mason, Wash., calling for 460 to 560 tons of blue annealed sheets, and new bids will be called for soon. The Freewater, Ore., pipe-line job, for which 280 tons will be needed, has been postponed temporarily. Western Pipe & Steel Co. was awarded 700 tons by the Pan-American Petroleum Co., Los Angeles, and Llewellyn Iron Works took 600 tons for Associated Oil Co. tanks at Ventura, Cal.

Bars.—Awards in reinforcing bars during the week totaled 5638 tons, including the 4700 tons for the Oakland-Alameda estuary tube taken by the three local mills. Prices are unchanged at 3.35c., base, carload, out of stock, and 3.80c., l.c.l., although 3.25c. is being quoted for 250 tons and more. Mill prices are 2.50c., c.i.f. Coast ports, for large tonnages. Soft steel bars are being quoted by local mills 2.55c. to 2.60c., base. Among the larger lettings in reinforcing bars were the following:

Garden City Bank addition, San Jose, Cal., 300 tons, to Truscon Steel Co.

City of Los Angeles, Cal., 198 tons, to Truscon Steel Co. Pacific Gas & Electric Co., San Francisco, Cal., 190 tons, to Badt-Falk & Co.

Pacific Telephone & Telegraph Co. building, Fresno, Cal., 100 tons, to unnamed jobber.

Southern Pacific Railroad station, Sacramento, Cal., 150 tons, to W. S. Wetenhall Co.

Warehouse Business.—Weather conditions during the early part of the week tended to curtail business somewhat, although jobbers' sales records show a gain for May over April. Prices are unchanged.

Merchant bars, \$3.30 base per 100 lb.; merchant bars, $\frac{1}{2}$ in. and under, rounds, squares and flats, \$3.30 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles, $\frac{1}{2}$ in. and larger \times $1\frac{1}{2}$ in. to $2\frac{1}{2}$ in., inc., \$3.30 base, per 100 lb.; channels and tees, $\frac{1}{2}$ in. to $2\frac{1}{2}$ in., inc., \$3.30 base, per 100 lb.; angles, beams and channels, 3 in. and larger, \$3.15 base, per 100 lb.; tees, 3 in. and larger, \$3.20 base, per 100 lb.; universal mill plates, $\frac{1}{2}$ in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel, $\frac{1}{2}$ in. and thicker, \$6.20 base, per 100 lb.; wire nails, \$4 base, per 100 lb.; cement coated nails, \$3 base, per 100 lb.; No. 10 blue annealed sheets, \$4.20 per 100 lb.; No. 28 galvanized sheets, \$6.25 per 100 lb.; No. 28 black sheets, \$6.25 per 100 lb.

Cast Iron Pipe.—Prices are unchanged at \$52 to \$53 base, delivered in the San Francisco district. San Diego, Cal., split its award of 1677 tons of 4, 6, 8 and 10-in. Class B cast iron pipe between the National Cast

Iron Pipe Co. and the United States Cast Iron Pipe Co. No other lettings of any size were made.

Steel Pipe.—Southern County Gas Co., Los Angeles, Cal., placed 150 tons of black steel pipe with the Grinnell Co. of the Pacific, and the Southern Pacific Co. has placed 104 tons of 6-in. black pipe with an unnamed jobber. An oil company in Wyoming is inquiring for 4622 tons of 12-in. line pipe.

Coke.—The demand is somewhat slack, although a number of small orders were placed during the week. A quotation of \$14.50 for English beehive was made during the week, which is 50c. below recent quotations. Birmingham, Ala., coke is now being quoted at \$19 to \$20 delivered, a reduction of 50c. Importers have a fairly large tonnage of English coke available for immediate delivery.

English beehive, \$14.50 to \$17 at incoming dock, and English by-product, \$12.50 to \$14; Birmingham, Ala., by-product, \$19 to \$20 delivered; Wise County, Va., beehive, \$22 delivered.

Old Material.—There has been a lessening in demand during the past week, and price tendencies are somewhat weaker, although no specific changes in quotations have been made. One local broker handled more than 24,000 tons during April, and expects to handle another 20,000 tons by the end of May, which is considered noteworthy. Heavy melting steel is still being quoted at \$11 to \$12, both here and in Los Angeles.

Cincinnati

Foundries Buy Heavily for Third Quarter—Better Sheet Business

CINCINNATI, May 26.—Northern pig iron sales increased considerably during the past week and inquiries indicate that melters are desirous of covering their third quarter requirements at the present low prices. Although Lake interests are taking business in this territory at \$18.50, Cleveland, Ironton furnaces are continuing to sell at \$19 to \$19.50, furnace. Silvery quotations are stronger with 6 per cent bringing \$24, furnace. One furnace has turned down business offered under this figure. Dealers continue to sell Tennessee iron at \$18, Birmingham, but it is thought that attractive tonnages can be booked at \$17.50, Birmingham. Alabama furnaces have not changed from their quotation of \$20 to \$22, Birmingham, and are practically out of the local market for the present. Many foundries have bought rather heavily in the past 10 days. Large tonnages of Northern iron have been sold quietly without the broadcasting of a general inquiry. Other sales are as follows: 1600 tons of Northern foundry and 800 tons of Tennessee iron to a southern Indiana melter; 1000 tons of malleable to northern Ohio; 500 tons of 8 per cent silvery to the American Stove Co., St. Louis, for its Indianapolis and Bedford, Ohio, plants; 400 tons of Northern foundry to a Cincinnati melter; 300 tons of malleable to a southern Ohio consumer; 300 tons of Ironton iron to a Georgia melter; 300 tons of Northern foundry to Hamilton, Ohio; 200 tons of low phosphorus iron to St. Louis; 200 tons of Northern foundry to Galion, Ohio; 175 tons of Northern foundry to a local melter; 100 tons of Tennessee iron to a southern Ohio melter; and 100 tons of Bessemer iron to a Detroit consumer. Outstanding inquiries include 2000 tons of Northern foundry for the Swayne-Robinson Co., and a like tonnage of foundry iron for a southern Ohio melter; 500 to 1000 tons of Northern foundry for an Evansville, Ind., consumer; 300 to 500 tons of Northern and 200 to 300 tons of Southern for the Hayes Pump & Planter Co., Galva, Ill.; 500 tons of Southern for the Toledo Stove & Range Co., Toledo, Ohio; 500 tons of 7 to 8 per cent silvery for the Cadillac Motor Car Co., Detroit; 300 tons of Northern foundry for the Peerless foundry, Indianapolis, and 300 tons of Northern foundry for a Peoria, Ill., melter.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25
(base) \$24.05 to \$25.05

Alabama fdy., sil. 2.25 to 2.75	24.55 to	25.55
Tennessee fdy., sil. 1.75 to 2.25	22.05	
Southern Ohio silvery, 8 per cent	28.77	
Southern Ohio fdy., sil. 1.75 to 2.25	21.27 to	21.77
Southern Ohio, basic (nominal)	22.27	
Southern Ohio malleable	22.27	

Bars, Shapes and Plates.—Orders are coming in at a fair rate, but are confined principally to small tonnages. Leading sellers are encouraged at the trend of the market, which is turning toward increased sales. Carload business is still going at 2.10c., Pittsburgh, but larger bookings can be made readily at 2c. Reports have been received that less than 2c. has been done on plates, but this is not representative of the local market. Buyers are placing only small orders and are depending upon speedy delivery from mills. Inquiries for bars have not shown much life in the past week.

Sheets.—Tonnage booked during the week reveals an increase over the previous week. One large company's sales totaled a larger volume than during any other week since November. A better tone prevails locally and sellers feel that the bottom has been reached. However, it is not thought that there will be a stiffening of quotations in the immediate future. Some of the smaller, independent mills are making heavy concessions, to keep their plants operating and, consequently, have been forcing the market down to unusually low levels. Black sheets have been sold at 3.15c., Pittsburgh, but the larger mills refuse to meet this price. Holding to 3.30c., they are booking considerable business. Several sellers have made a 4.25c., Pittsburgh, price on galvanized sheets, although others are holding out for 4.30c. and 4.40c. Prevailing quotations on blue annealed range from 2.30c. to 2.40c., Pittsburgh. Several mills have been doing considerable business on automobile sheets, which are priced at 4.25c. to 4.40c., Pittsburgh. Mills in Cincinnati territory are reported operating at about 60 per cent of capacity. Buyers, in many cases, are inclined to shop around and get the best possible figure, before placing business. Most orders are for small tonnages for immediate delivery.

Wire Products.—Sluggishness is still evident in the local market. Little buying is being done, although increased sales have been made in the past two weeks. Consumers are satisfied to purchase in a hand-to-mouth fashion. Inquiry brings out the fact that their stocks are at a low point and that they will be coming into the market shortly to buy, at least in limited quantities. The demand for nails is quiet. No change has been recorded from the 2.75c., mill, quotation. There has been slightly more activity in wire goods. In some instances, mills in the Pittsburgh district are reported to be meeting the price of 2.64c., delivered in Cincinnati, which is the prevailing quotation by mills in Ironton territory.

Reinforcing Bars.—The local market is quiet. The Booth Memorial Hospital, Covington, Ky., which involves about 125 tons, has awarded a contract to the Pollak Steel Co. The general contract for the new building for the American Products Co., Cincinnati, has been given to the Fisher-DeVore Construction Co., which will buy about 250 tons of reinforcing bars. There are no other pending projects calling for attractive tonnages. The price on new billets is fairly steady at 2.05c. to 2.10c., mill. Rail steel is quoted at 1.95c., mill, with some business being booked at 1.90c.

Structural Steel.—The Berger Iron Works, Akron, Ohio, will supply approximately 1500 tons for the new building of the Third National Bank, Dayton. This was the only sizable award made during the past week. Several small jobs have been let in Cincinnati, each going at low prices. New projects are scarce. Bids are being taken until June 20 by Herman & Brown, Dayton, architects, on the new Dayton Masonic Temple, involving about 1500 tons. The general contract for the erection of new shops at Russell, Ky., has been awarded by the Chesapeake & Ohio Railroad to Joseph E. Nelson & Son, Chicago.

Warehouse Business.—Sales have been maintaining a fair average, but it is anticipated that the volume

of business this month will show a decrease as compared with April tonnage. The number of orders coming in is good, but many are for small lots of goods. Structural steel and reinforcing bars have both been moving nicely, but sheets, pipes and tubes have displayed weakness. Consumers are buying only sufficient material to meet immediate requirements. Cold-rolled products continue to command fair sales in the automotive field. Prices are holding up well, with the exception of nails and wire.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled squares, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, \$3.05 per 100 lb.; common wire nails, \$3.15 per keg base; cement coated nails, \$2.65 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes, prices net per 100 ft., lap welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Fluorspar.—The Ford Motor Co., Detroit, has purchased 100 tons of lump fluorspar. It is reported that fluorspar can now be obtained for \$17.50 for prompt shipment.

Coke.—Increased sales of foundry coke have been made in Cincinnati territory. Specifications for foundry grades are running considerably ahead of April. New River foundry coke is now selling at \$7.50 to \$8, ovens. Furnace coke has been quiet.

Old Material.—A better feeling prevails in the scrap market. However, sales to mills are confined to small tonnages. Dealers have much stock on hand, but will not sell unless they can obtain a favorable price. Quotations are stronger, but have not changed. The Chesapeake & Ohio and the Louisville & Nashville have closed on large lists.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton

Heavy melting steel	\$13.00 to \$13.50
Scrap rails for melting	13.50 to 14.00
Short rails	17.50 to 18.00
Relaying rails	28.00 to 28.50
Rails for rolling	15.00 to 15.50
Old car wheels	14.00 to 14.50
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	16.00 to 16.50
Agricultural malleable	14.50 to 15.00
Loose sheet clippings	10.00 to 10.50
Champion bundled sheets	12.00 to 12.50

Per Net Ton

Cast iron borings	8.50 to 9.00
Machine shop turnings	7.50 to 8.00
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	15.00 to 15.50
Iron axles	22.00 to 22.50
No. 1 railroad wrought	11.00 to 11.50
Pipes and flues	7.50 to 8.50
No. 1 busheling	9.50 to 10.00
Mixed busheling	8.50 to 9.00
Burnt cast	9.50 to 10.00
Stove plate	10.00 to 10.50
Brake shoes	11.00 to 11.50

Cleveland

Improved Steel Buying—In Pig Iron 105,000 Tons Sold in Week

CLEVELAND, May 26.—The volume of steel business shows an improvement and with the gain during the latter part of the month the orders taken in this territory by some of the mills in May will show a slight increase over April. The automotive industry is still keeping at the peak production and while it is buying conservatively, some business is coming from this source in alloy steel, sheets, light plate and strip steel for deliveries extending into the third quarter. One manufacturer of automobile parts placed 1100 tons during the week. Some new business is coming from the agricultural implement manufacturers, who are operating plants at capacity. In the building field new inquiry for structural material is light but considerable building work is coming out requiring round lots of reinforcing steel. Among new inquiries is one for 40 oil stills requiring 1200 tons of plates. Lake shipyards are figuring on two boats in addition to the several vessels for which inquiries were previously reported. There is virtually no change in the price sit-

uation on steel bars, plates and structural material. The market is firm at 2c. on steel bars and shapes. While some mills are holding to 2.10c. on small lots of steel bars, others are taking small orders at 2c. The plate market still lacks strength, with some fair lots going at 1.90c., Pittsburgh. However, one round lot is reported to have gone at 1.82½c., Pittsburgh, although the seller had a 10c. freight advantage.

Pig Iron.—Buying continues in heavy volume and inquiry is still plentiful. Sales by Cleveland interests during the past week aggregated 105,000 tons in foundry and malleable grades and their total sales this month have reached 285,000 tons. Business has been pretty well scattered among various districts and various consuming industries. Consumers appear to be buying conservatively and in this respect their policy differs from the buying movement last November, when there was a great deal of speculative buying. Neither are foundries buying hurriedly as they often do when there is active buying and a possibility of a price advance. The market has become fairly well established at \$19 for foundry and malleable grades and the price structure appears somewhat firmer as some of the producers are not inclined to go below \$19, which has become the generally recognized price by both Lake and Valley furnaces. In some cases concessions from this price have been made of about 25c. a ton to overcome a freight disadvantage and in other cases the silicon differential has been waived. On one lot a Lake furnace went to \$18.87. In Michigan Lake furnaces have found keen competition from Chicago brokers, and the market in that state has settled down to \$19 to \$19.50. In Cleveland the price is unchanged at \$20 at furnace. Sales during the week range from small lots up to 5000 tons, mostly for the third quarter, although some of the orders were for the entire last half. The General Electric Co. placed 2800 tons with a Cleveland interest for its eastern plant and is about to close for 2000 tons for Erie. The American Radiator Co. purchased 1000 tons of malleable iron for Buffalo. The Standard Sanitary Mfg. Co. has an inquiry out for a round tonnage of both Northern and Southern foundry iron. We note the sale of a 1000-ton lot of 7 per cent Ohio silvery iron at \$25, or \$1 below the schedule. Inquiries are pending from Indiana for sizable lots.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 from Birmingham:

Basic, Valley furnace	\$18.50
N'th' No. 2 fdy., sil. 1.75 to 2.25	20.50
Southern fdy., sil. 1.75 to 2.25	\$24.50 to 26.01
Malleable	20.50
Ohio silvery, 3 per cent	29.02 to 29.52
Standard low phos., Valley furnace	28.50

Iron Ore.—The inquiry from a Pittsburgh district consumer for 50,000 to 100,000 tons of ore which brought out some concessions from regular prices is still pending. There are other reports of price concessions but some of the sales that are reported to have been made below the market were low grade ores, which, when figured back with the present method of determining unit values, brought regular prices.

Iron Ore Consumption.—The consumption of Lake Superior ore during April amounted to 4,812,997 tons as compared with 5,490,245 tons in March, or a decrease of 677,248 tons. The amount consumed in April last year was 4,881,855 tons. Ore on hand at furnaces May 1 was 13,008,760 tons. The amount at furnaces and Lake Erie docks May 1 was 17,311,802 tons as compared with 19,434,603 tons on May 1, last year. Interior furnaces in the Central district consumed 2,563,735 tons in April, a decrease of 426,622 tons. Lake front furnaces consumed 2,018,521 tons, a decrease of 224,349 tons. Eastern furnaces consumed 113,006 tons, a decrease of 20,948 tons and all rail supplied furnaces used 117,735 tons, a decrease of 5329 tons. On April 30 there were 192 furnaces in blast using Lake ore, a decrease of 23 for the month.

Semi-Finished Steel.—A Cleveland consumer has purchased 1000 tons of sheet bars at \$35, Youngstown, but little other business has come out since the price reduction. A Cleveland mill is meeting the reduced price named by Youngstown mills. Producers continue to hold for \$46, Cleveland, for wire rods.

Strip Steel.—The 3.75c. price on cold rolled strip steel has been shaded slightly on round lot orders. Hot rolled strip is firm at 2.20c. for wide material and 2.40c. for narrow strip, hoops and bands. Hot rolled strip is fairly active but new demand for cold rolled strip is rather quiet.

Sheets and Tin Plate.—No further concessions from the recent minimum prices on sheets have appeared and there is a feeling in the trade that prices will hold at present levels. If this proves true, the sheet mills that buy their steel will be in a better position than they have been for some time because of the \$2 a ton reduction on sheet bars. The price range is from 3.20c. to 3.30c. for black, 2.40c. to 2.50c. for blue annealed and 4.30c. to 4.40c. for galvanized. A concession of \$3 a ton to \$5.35 has appeared on tin plate.

Reinforcing Bars.—These are in good demand with no change in prices. Rail steel bars range from 1.80c. to 1.90c. The Franklin Steel Works has taken 140 tons for a factory for the Philadelphia Rubber Co., Akron. The Union Terminals Co., Cleveland, is inquiring for 120 tons for the Abbey Avenue bridge, and the American Insurance Union Building, Columbus, will require several hundred tons.

Warehouse Business.—A reduction in warehouse prices on sheets has been made by a leading Cleveland jobber in order to preserve about the usual spread between mill and warehouse prices. The reduction is \$3 a ton on galvanized and \$2 a ton on black and blue annealed sheets. Jobbers report a steady improvement in warehouse business.

Bolts, Nuts and Rivets.—It is expected that present bolt and nut prices will remain in effect through the third quarter and some of the manufacturers announce that they will shortly advise the trade to that effect. Specifications continue fairly heavy but there is not much new business. Prices are firm. Rivets are quiet with large rivets somewhat irregular and shaded \$2 a ton. On small rivets, 70 and 10 per cent off list is the usual price, although some good lot business is bringing out a 5 per cent additional discount.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.15c.; No. 28 galvanized sheets, 5.20c.; No. 10 blue annealed sheets, 3.15c. to 3.50c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3.05 per 100 lb.; No. 9 galvanized wire, \$3.50 per 100 lb.; common wire nails, \$3.15 base per 100 lb.

Old Material.—A Cleveland consumer during the week purchased some small lots of heavy melting steel at \$17 delivered and borings and turnings at \$13.75. Heavy melting steel has advanced about 25c. a ton and the market on other grades is fairly firm at recent quotations. The Buick Motor Car Co. has received bids for 4000 tons of scrap in various grades, and several other lists from Michigan automobile companies covering their June production are expected out this week. While there is not much new demand, the consumption of scrap appears to nearly equal the production.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$16.00 to \$16.50
Rails for rolling.....	15.75 to 16.25
Rails under 3 ft.....	18.00 to 18.25
Low phosphorus melting.....	18.50 to 18.75
Cast iron borings.....	13.00 to 13.25
Machine shop turnings.....	13.00 to 13.25
Mixed borings and short turnings.....	13.00 to 13.25
Compressed sheet steel.....	13.25 to 13.75
Railroad wrought.....	12.25 to 12.50
Railroad malleable.....	17.50 to 17.75
Light bundled sheet stampings.....	11.25 to 11.50
Steel axle turnings.....	14.75 to 15.00
No. 1 cast.....	17.25 to 17.75
No. 1 busheling.....	12.75 to 13.00
Drop forge flashings.....	11.25 to 11.75
Railroad grate bars.....	13.00 to 13.25
Stove plate.....	13.00 to 13.25
Pipes and flues.....	8.25 to 8.50

The Woodward Iron Co. is opening a new shaft coal mine in its field near the Mulga and Dolomite mines, not far from the blast furnaces and by-product coke oven plant at Woodward, the new development to be known as the Crockard shaft, in honor of the president of the company, Frank Crockard. The plans provide for this shaft to have upward of 5000 tons daily capacity.

Philadelphia

Producers of Steel and Pig Iron Take Firmer Stand on Prices

PHILADELPHIA. May 26.—A more determined stand on prices is being taken by steel companies and producers of pig iron. This is coupled with slightly better buying in many lines. The gain in plate buying, mentioned last week and the week before, has continued until now Eastern plate mills have the best operation in many weeks. Not only that, but the hand-to-mouth buying of small lots has been succeeded to some extent by purchases of larger lots, some up to 500 or 1000 tons, and in almost every instance shipment within a week or two is demanded, indicating that needs long deferred have become urgent. Some of the larger producers of sheets are taking a firmer attitude toward prices, announcing that they will not go below the prevailing levels, 2.40c. for blue annealed, 3.30c. for black and 4.30c. for galvanized. Likewise prices of both hot and cold rolled strips have stiffened, at least with certain companies. On small lots of bars and shapes some of the Pittsburgh and Youngstown mills are quoting 2.10c. and some orders tendered at less have been turned down. Owing to the competition of Eastern mills they are not able to take quite the same attitude on plates.

Pig iron buying is in better volume and the week marks the first sales of basic in some time. The quantity is not large, but the price is better than would have been entertained two weeks ago. There is less of a disposition to sell foundry iron at \$20, the base which has prevailed on the larger transactions of the past two or more weeks, and \$20.50 is a more common quotation. Scrap is not making any striking changes, but its undertone continues firm.

Pig Iron.—Buying of foundry iron, largely for third quarter, but also to finish out second quarter, has developed within the past week on an increasing scale. There has been a fair number of thousand ton lots and buyers have been less inclined to haggle over prices. The week also brought the first basic iron buying of many weeks. One company bought 1000 tons, paying \$21.64, delivered, while another paid \$22, delivered, for 1000 tons and had under negotiation 3000 tons additional at \$21.50, delivered, and this latter business will be closed before this report reaches its readers. Our quotation on basic iron, in the absence of sales, has been nominal, being based on what producers were willing to accept for this grade of iron. In the light of the week's sales we change our quotation to \$21.50 to \$22, which is a 50c. advance from last week's quotation. While \$20 remains as the price at which attractive lots of foundry iron would be sold by some furnaces, there is a disposition this week to get away from that figure and quotations of \$20.50, base, are more common. The fairly good buying of the last two or three weeks has put furnaces in a better position and there is less iron pressing on the market for immediate sale. Evidence accumulates that the bottom has been reached, but just when the turn will come depends largely on the extent that buyers enter the market within the next few weeks. A healthy indication is that some foundries are asking that shipments be anticipated, this being taken as a sign that here and there the melt is greater than was anticipated. Among the important business of the week was the purchase of a few thousand tons of malleable iron by a New England foundry, some of this business coming to this market.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rate varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25	\$20.76 to \$21.63
East. Pa. No. 2X, 2.25 to 2.75	21.26 to 22.13
East. Pa. No. 1X	21.76 to 22.63
Virginia No. 2 plain, 1.75 to 2.25	
sil.	
Virginia No. 2X, 2.25 to 2.75	28.67 to 29.17
Basic delivery eastern Pa.	29.17 to 29.67
Gray forge	21.50 to 22.00
Malleable	21.50 to 22.00
Standard low phos. (f.o.b. furnace)	21.50 to 22.50
Copper bearing low phos. (f.o.b. furnace)	24.00 to 25.00
	25.00 to 26.00

Ferroalloys.—There is nothing significant to report on ferromanganese. Small sales at \$115, furnace or seaboard, constitute the only activity.

Billets.—Billet prices have not been tested, but some producers would make slightly lower prices on desirable business. There is no demand for rerolling billets and only small sales of forging billets. The former are nominally quoted at \$35.50, Pittsburgh, with a \$5 extra for forging quality.

Plates.—The better buying of plates, first reported two weeks ago, seems to be more than a flash in the pan for it has continued in a fair way. It would appear that many consumers had waited overly long for further reductions in prices, and finding the market showing more resistance, had decided to enter their orders. This is borne out by the fact that several orders were offered for immediate rolling with shipment in a week. Needs seem to have accumulated, some of the orders being for much larger lots than are ordinarily bought at a time when buyers have any doubt about price movements. Eastern mills are talking more determinedly of 1.90c., Pittsburgh, as the minimum. On small lots 2c. is being obtained.

Structural Shapes.—The wide variation in prices quoted on structural shapes is illustrated by the action of a buyer in sending out three orders for 50 tons each to three companies, each order being marked at 1.90c., Pittsburgh, by the buyer. One company accepted the order, another returned it with the explanation that its price was on the basis of 2c., Pittsburgh, and a third returned the order with the statement that its price on tonnage of that size was 2.10c., Pittsburgh. That is and has been the situation in shapes for weeks. On some of the larger lots 1.90c. has been shaded, as previously reported, but generally the market range is 1.90c. to 2.10c., Pittsburgh, or equivalent.

Bars.—In steel bars the situation differs from plates and shapes in this way: Pittsburgh and Youngstown mills have less competition from Eastern mills on bars than on the other products and hence are able to obtain their own prices with more regularity. Bar producers in the Pittsburgh-Youngstown district are quoting 2.10c., Pittsburgh, on small lots and are getting it in an increasing number of cases. In fact, it is stated that this figure has been had on as much as 100 tons. Bars are obtainable, however, at 2c., Pittsburgh, but this price is being reserved more for the larger tonnages. Demand for bar iron is almost nothing and the price remains unchanged at 2.22c., Philadelphia.

Sheets.—In an effort to end the demoralization in sheet prices which has existed for many weeks some producers both in this territory and in the Pittsburgh-Youngstown district are taking a firmer stand on prices. Regardless of what some companies may do, several of the larger producers will not, they say, go below 2.40c. on blue annealed, 3.20c. on black and 4.30c. on galvanized, these being Pittsburgh f.o.b. prices. A moderate volume of business is being done and largely at the above-mentioned prices.

Warehouse Business.—On some items prices out of stock show signs of weakness and there may be reductions before next week. Buying is in fairly good volume. Prices for local delivery are as follows:

Soft steel bars and small shapes, 3.10c.; iron bars (except bands), 3.10c.; round edge iron, 3.50c.; round edge steel, iron finished, $1\frac{1}{2}$ x $\frac{1}{2}$ in., 3.50c.; round edge steel planished, 4.80c.; tank steel plates, $\frac{1}{4}$ in. and heavier, 3.10c.; tank steel plates, $\frac{1}{8}$ in., 3.25c.; blue annealed steel sheets, No. 10 gage, 3.70c.; black sheets, No. 28 gage, 4.70c.; galvanized sheets, No. 28 gage, 5.85c.; square, twisted and deformed steel bars, 2.85c.; structural shapes, 2c. to 3.10c.; diamond pattern plates, $\frac{1}{4}$ -in., 5.30c.; $\frac{1}{8}$ -in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 4.15c.; squares and flats, cold-rolled steel, 4.65c.; steel hoops, 4.20c. base; steel bands, No. 12 gage to $\frac{1}{8}$ in., inclusive, 3.95c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

Imports.—Last week's receipts at Philadelphia included 2297 tons of pig iron from India and 150 tons from the Netherlands; 800 tons of chrome ore from Greece; 1000 tons of ferromanganese from Germany; 200 tons of ferromanganese from England; 410 tons of structural steel from Belgium and 12 tons from Germany.

Old Material.—While the scrap market remains firm, there has not been enough demand from con-

sumers to push prices up. Heavy melting steel is stronger than a week ago and so is pipe scrap, but other grades remain as quoted in the issue of May 21. It is becoming more difficult for brokers to buy heavy melting steel at \$14.50 for delivery at any point, and in a few instances \$15 has been paid by brokers. A plate mill has made an effort to buy a few thousand tons at \$15.50, delivered, but is reported to have picked up only a part of this quantity as many dealers and brokers are not anxious to commit themselves at that figure, expecting higher prices soon.

We quote for delivery consuming points in this district as follows:

No. 1 heavy melting steel.....	\$15.00 to \$15.50
Scrap rails.....	15.00 to 15.50
Steel rails for rolling.....	16.50 to 17.00
No. 1 low phosph. heavy 0.04 and under.....	20.00 to 21.00
Couplers and knuckles.....	18.50 to 19.50
Rolled steel wheels.....	18.50 to 19.50
Cast-iron car wheels.....	17.00 to 17.50
No. 1 railroad wrought.....	17.50 to 18.00
No. 1 yard wrought.....	16.50 to 17.00
No. 1 forge fire.....	14.00 to 14.50
Bundled sheets (for steel works).....	12.50
Mixed borings and turnings (for blast furnace use).....	11.50 to 12.50
Machine shop turnings (for steel works use).....	12.50
Machine shop turnings (for rolling mill use).....	12.00
Heavy axle turnings (or equivalent).....	14.00 to 15.00
Cast borings (for steel works and rolling mill).....	12.50 to 13.00
Cast borings (for chemical plants).....	15.00 to 15.50
No. 1 cast.....	17.00 to 17.50
Heavy breakable cast (for steel plants).....	15.50 to 16.00
Railroad grate bars.....	12.00 to 12.50
Stove plate (for steel plant use).....	13.00 to 13.50
Wrought iron and soft steel pipes and tubes (new specifications).....	15.00 to 15.50
Shafting.....	21.00 to 22.00
Steel axles.....	21.50 to 22.50

EXPORT TRADE INACTIVE

Japan Seeking Tin Plate in Britain—Buys Gas Pipe and Rails Here—Importers Active

NEW YORK, May 26.—Both the Japanese and Chinese markets continue somewhat depressed with merchant inquiry at a low ebb and the principal business coming from the larger corporations and government sources in Japan. The long expected inquiry of the Nippon Oil Co. is understood to have been issued but only in the United Kingdom, where Welsh tin plate mills are reported to be quoting on about 38,000 base boxes of tin plate for this Japanese company.

Another large inquiry recently in the market, the call for bids by the Tokio Gas Co. on 1,100,000 ft. of gas pipe was placed with the New York branch of a large Japanese export and import house. The order of Kioto municipality for 1035 pieces of 91-lb. high T-rails was awarded to the same exporter. Bids open May 28 on seven miles of 91-lb. high T-rails with 1000 pair of fish plates and three miles of 100-lb. grooved rails with 1500 pair of fish plates, a total of about 1500 tons, for Tokio municipality.

Chinese trade continues limited to small transactions in wire shorts, tin plate waste and tin plate scrap. Wire shorts are quoted at about \$45 per ton, c.i.f. Chinese port, and offers by Chinese merchants for tin plate wasters seldom exceed \$3.20.

Lower British Shipping Rates to Far East

Lower ocean freights to the Far East from American ports seem possible as a result of the recent action of the London shipping conference in reducing the British rates, although, even with the reduction in force, the United Kingdom rates are higher than the freight from the United States. The conference rate was reduced on all steel materials but rails, including tin plate, sheets and pig iron. The average reduction was 5s. per ton, or from the former rate of 40s. to 35s. per ton.

Importers of steel in the United States continue active but sales are almost exclusively of small lots. Recent offers from European steel producing centers show that Thomas steel of intermediate grade can be delivered at Atlantic ports for \$47.50 per ton duty paid for square, twisted or deformed bars, or 2.12c. per lb.; \$43 per ton for reinforcing bars, etc.

FABRICATED STEEL

Awards for Week Total 35,400, Which Is Larger Than Average of Recent Weeks

Structural steel awards came to a high figure for the past week, totaling 35,400 tons, as reported to THE IRON AGE. This figure is higher than the average and in fact has been exceeded only a few times during the year. The volume of new projects reported does not reach a high figure, being only 11,700 tons, but this is not necessarily significant. Not included in this latter figure are five loft buildings in New York, to be built by M. Kanner, on which estimates of tonnage were not available, but the total will run many thousands of tons. Reports to steel companies, which are preliminary to the inquiries for steel, indicate that a good deal of building work is in prospect. Awards include:

Standard Oil Co. of New Jersey, sheds, 900 tons, to American Bridge Co.

Cathedral of St. John the Divine, steel bents, 300 tons, to Post & McCord and American Bridge Co.

New York Railways Co., alterations to car barns, 200 tons, to McClintic-Marshall Co.

New York subway system, section under Central Park West, 3000 tons, awarded to American Bridge Co. by Arthur A. Johnson Corporation, general contractor.

Hotel, Lancaster, Pa., addition, 250 tons, to Shoemaker Bridge Co.

Aldine garage, Philadelphia, 500 tons, to an unnamed fabricator.

Theater, Camden, N. J., 500 tons, to New York Shipbuilding Corporation.

Garage, Albany, N. Y., 400 tons, to Levering & Garrigues Co.

Loft building, West Forty-eighth Street, New York, 1100 tons, to Paterson Bridge Co.

M. Kanner, three loft buildings in the Seventh Avenue garment district, totaling 2000 tons, to McClintic-Marshall Co.

Kanotex Refining Co., Arkansas City, Kan., 150 tons, to Graver Corporation.

Loft building, Thirty-sixth Street and Eighth Avenue, New York, 3000 tons, to Taylor-Fichter Steel Construction Co.

Loft building, Forty-fourth Street and Sixth Avenue, 1200 tons, to Taylor-Fichter Steel Construction Co.

Loft building, Forty-first Street and Seventh Avenue, New York, 1000 tons, to A. E. Norton, Inc.

Loft building, 62 West Forty-seventh Street, New York, 1600 tons, to an unnamed fabricator.

Ohio River Co., 30 barges, 4725 tons, to American Bridge Co.

Standard Oil Co. of Louisiana, two barges, 1000 tons, to American Bridge Co.

Detroit Edison Co., Detroit, transmission towers, 350 tons, to American Bridge Co.

Third National Bank, Dayton, Ohio, 1500 tons, to Berger Iron Works.

Hinckley & Schmitt, Inc., plant, Chicago, 370 tons, to American Bridge Co.

Commonwealth Edison Co., extension to Crawford Avenue power station, Chicago, 566 tons, to American Bridge Co.

Missouri Pacific Railroad, deck plate girder spans between St. Louis and Jefferson City, Mo., 300 tons, to American Bridge Co.

Wasson Building Corporation, theater, store and office building, Fifty-ninth Street and Kedzie Avenue, Chicago, 292 tons, to Wendnagel & Co.

Church of St. Basil, Chicago, 172 tons, to Hansell-Ecock Co.

Twelfth Church of Christ Scientist, Chicago, 110 tons, to Midland Structural Steel Co.

Pacific Gas & Electric Co., four transmission towers at Antioch, Cal., 900 tons, to American Bridge Co.

Emsee Steel Products Co., Los Angeles, 1800 tons for stock, to Columbia Steel Corporation.

Associated Oil Co., Ventura, Cal., two 80,000-bbl. tanks, 600 tons, to Llewellyn Iron Works.

Vancouver, B. C., pipe line, 6000 tons, to Vancouver Engineering Works.

Pan-American Petroleum Co., Los Angeles, two 100,000-bbl. tanks, 700 tons, to Western Pipe & Steel Co.

General Electric Co., addition to Philadelphia plant, 700 tons, to Belmont Iron Works through Turner Construction Co., general contractor.

Landis Machine Co., Waynesboro, Pa., plant extensions, 125 tons, to Belmont Iron Works.

Reading Railroad, bridge at Pottsville, Pa., 150 tons, to McClintic-Marshall Co.

Gladstone High School, Hazelwood, Pittsburgh, 450 tons, to McClintic-Marshall Co.

Chase Bag Co., Toledo, factory, 250 tons, to Austin Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Theater and office building, St. Petersburg, Fla., 500 tons.

Sinclair Oil Refining Co., oil tanks, 500 tons.

Theater, Morristown, N. J., 300 tons.

Clinton Investment Co., 24-30 Commerce Street, Newark, N. J., bank and office building, 1500 tons.

Boston Elevated Railway, car house at Forest Hills, 350 tons, and power house at Medford, 215 tons.

Scholasticate, Weston, Mass., 130 tons.

Amherst College, Amherst, Mass., dormitory, 115 tons.

Masonic Temple, Dayton, Ohio, 1500 tons.

McCrory's store, Cleveland, addition, 150 tons.

St. Ignatius School, Cleveland, 200 tons.

Humble Oil Co., oil storage tanks for Louisiana locations, 4000 tons.

State Bank & Trust Co. building, Evanston, Ill., 300 tons.

Hammond Improvement Association, theater, Hammond, Ind., 800 tons.

South Park Commission, viaduct, Oakley Boulevard, Chicago, 500 tons, general contract bids to be taken June 2.

Chicago Great Western Railroad, Roberts Street viaduct, St. Paul, Minn., 200 tons.

Dixon irrigation project, Reclamation District No. 2068, Woodland, Cal., 150 tons.

City of Seattle, Wash., one mile, 42-in., lock bar pipe, 300 tons.

RAILROAD EQUIPMENT

Buying of Freight Cars Almost Negligible, Total for Week Being 217

Orders for freight cars in the past week have been exceedingly light, totaling only 217, and many of these are of the smaller type for private service. No fresh inquiries are reported, although car builders remain expectant that substantial demands upon them will appear within the near future. The chief items are given in subjoined paragraphs.

Freight cars in need of repair on May 1 totaled 189, 514 or 8.2 per cent of the number on line, according to reports filed with the Car Service Division, American Railway Association, and on the same date there were 11,101 locomotives in need of repair or 17.3 per cent of the number on line.

The Green Bay & Western Railroad has purchased 150 box cars from the Pressed Steel Car Co.

The General Equipment Co. ordered 10 flat car bodies from the American Car & Foundry Co.

The United Electric Coal Co. has bought 30 all-steel rotary dump cars from the American Car & Foundry Co.

The Racket Brook Coal Co. has ordered 12 mine cars from the American Car & Foundry Co.

The Delaware, Lackawanna & Western has ordered 25 caboose cars from the Major Car Corporation.

The Richmond, Fredericksburg & Potomac has placed 4 express and 1 postal car with the Bethlehem Steel Corporation.

Directors of the South Indian Railway Co., Ltd., have announced that they are prepared to receive tenders for 110 meter-gage bogie steel high-sided freight cars, according to advice received by the Transportation Division, Department of Commerce, Washington. Specifications and forms of tender are available at the company's offices, 91 Petty France, Westminster, S. W. 1, London; a charge of £1, which will not be returned, will be made for each copy of the specification. Tenders addressed to the Chairman and Directors of the South Indian Railway Co., Ltd., marked "Tender for Wagons," must be left with the managing director not later than noon on Friday, June 19, 1925.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

May	Lake	Straits		Lead		Zinc	
		Electro-	tin	New	St.	New	St.
		lytic*	(Spot)	York	Louis	York	Louis
20	13.62 1/2	13.37 1/2	55.00	8.20	7.85	7.25	6.90
21	13.62 1/2	13.37 1/2	55.25	8.25	7.90	7.30	6.95
22	13.62 1/2	13.37 1/2	55.00	8.30	7.95	7.35	7.00
23	13.62 1/2	13.37 1/2	55.30	8.35	8.00	7.35	7.00
25	13.62 1/2	13.37 1/2	55.30	8.40	8.05	7.40	7.05
26	13.62 1/2	13.37 1/2	55.75	8.40	8.05	7.42 1/2	7.07 1/2

*Refinery quotation; delivered price 1/4c. higher.

New York

NEW YORK, May 26.

The tone of all the markets is quiet except that of lead. Despite but little demand, copper prices remain stationary. The tin market has advanced in only moderately active trading. Buyers of lead are very active and prices are much higher. The zinc market has advanced to higher levels but buying is light.

Copper.—For another week the price of electrolytic copper has remained practically unchanged at 13.62 1/2c., delivered. This condition has ruled for over three weeks and is quite unusual in the recent history of this market. Sellers report, however, only a very moderate demand either from domestic or foreign consumers and explain the steadiness of the market as due to their own disinclination to sell. Consumers who do buy are only purchasing for immediate needs and producers' order books are in good condition. Lake copper is quoted at 13.62 1/2c., New York.

Tin.—The week has been a very quiet one with demand light each day. Sales for the week have approximated 600 to 700 tons. Dealers have been the principal buyers, much of this being covering of short sales. The largest business of 300 tons was done on May 21. A comparison of this quantity with total sales reveals the dullness of other days. Yesterday about 200 tons changed hands among dealers and today about 100 tons, mostly futures. The continued absence of consumers from the market is the cause of considerable speculation. An interesting fact is the exporting recently of 20 tons of Australian tin to Hamburg and England, there being no market for it here. London prices today are considerably higher than a week ago with spot standard quoted at £252 10s., future standard at £252 10s. and spot Straits at £258. The Singapore price yesterday was £254 5s. Spot Straits tin was quoted in this market today at 55.75c., New York. Arrivals thus far this month have been 3850 tons, with 7035 tons reported afloat.

Lead.—Remarkable strength has developed during the week and the market is very strong and rapidly advancing. Buyers have rushed in and it is reported that consumers are building up stocks. This condition is pointed to as characteristic of this market. Lead for spot delivery is practically unquotable, being in the specialty class. The leading interest has advanced its contract quotation twice this week, or to 8.15c. on May 22 and to 8.25c., New York, on May 25. Quotations in the outside market are difficult to appraise, covering a wide range according to the seller. For early or June delivery lead has been sold by independent producers from 8.05c. to 8.50c., St. Louis, or from 8.40c. to 8.90c., New York.

Zinc.—Despite but little demand from galvanizers and other consumers, prime Western zinc has steadily advanced practically each day until today prime Western is quoted at 7.05c. to 7.10c., St. Louis, or 7.40c. to 7.45c., New York. The strength is explained as due to similar advances in the London market.

Nickel.—Wholesale lots of shot and ingot nickel are quoted at 31c. to 32c. per lb., with electrolytic nickel at 38c.

Antimony.—Chinese metal for spot delivery continues high at 17c., New York, duty paid, with May-June shipment from China quoted at 14c. to 15c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c., delivered.

Old Metals.—The only strong item is lead. Business in red and yellow metals is quiet. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	12.75
Copper, heavy and wire	12.00
Copper, light and bottoms	10.75
Heavy machine composition	10.00
Brass, heavy	8.25
Brass, light	7.00
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	8.75
Lead, heavy	7.70
Lead, tea	5.50
Zinc	4.50
Cast aluminum	13.00
Sheet aluminum	19.00

Chicago

MAY 26.—Lead and tin have advanced, while zinc has declined slightly, the other metals remaining unchanged. Copper is firm and there is no pressure to sell on the part of producers. A considerable tonnage changed hands in New York as the regular prices but, as a whole, the consuming trade is limiting its purchases to nearby deliveries. Although zinc has declined, a considerable volume of business has been placed. Lead, on the other hand, is dull, although prices are stronger. There is an extreme shortage of antimony, with little en route from abroad. The price of this metal, however, has not been affected. Among the old metals, lead pipe and grades of tin have advanced. We quote, in carload lots: Lake copper, 13.87 1/2c.; tin, 56.25c.; lead, 7.90c.; zinc, 6.95c.; in less than carload lots, antimony, 19c. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9.25c.; red brass, 8.25c.; yellow brass, 7.25c.; lead pipe, 7c.; zinc, 4c.; pewter, No. 1, 30c.; tin foil, 37c.; block tin, 42c.; all buying prices for less than carload lots.

Improved Operations in Mahoning Valley

YOUNGSTOWN., May 26.—Operating schedules announced this week by steel manufacturers in the Mahoning Valley show moderate fluctuations, chiefly in the direction of stronger production. Steel ingot output averages between 65 and 70 per cent, while sheet mill schedules indicate a production slightly in excess of 60 per cent.

Tube mill schedules show the addition of two units, one each by the Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co., giving the Mahoning Valley 13 active furnaces, of a total of 18. Skelp mill production has also been enlarged in a proportionate way. The A. M. Byers Co., Pittsburgh, is also operating rolling mills at its Girard, Ohio, works on a larger scale than heretofore.

The Republic Iron & Steel Co. has suspended its plate mill, but is operating five light bar mills. Strip mill output is on a moderately broader basis than heretofore. The principal strip makers in this territory, the Trumbull Steel Co. and the Sharon Steel Hoop Co., are operating such departments close to normal.

Of 127 sheet and jobbing mills in the Valley, from East Youngstown to Newton Falls, 88 were scheduled at the beginning of the week, but some only on a part-time basis.

More Demand for Molders

Information from the Middle West is that foundry operations are increasing somewhat. For nearly a year, up to a month ago, the supply of molders was quite in excess of the demand. Recently advertisements for molders have appeared in Chicago and Cincinnati papers on behalf of foundries in Indiana as well as at Detroit and Toledo. Some brass foundries have been taking on additional workers also. Railroad equipment plants as a rule have shown no signs of increased operations.

The Lake freighter William G. Mather, named for the president of the Cleveland Cliffs Iron Co., Cleveland, for which the boat was built, was launched at the River Rouge yard of the Great Lakes Engineering Works, at Detroit, May 23.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....	2c. to 2.10c.
F.o.b. Chicago, base, per lb.....	2.20c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....	2c. to 2.10c.
F.o.b. Chicago, base, per lb.....	2.20c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....	2c. to 2.10c.
Soft steel bars f.o.b. Chicago, base, per lb.....	2.10c. to 2.20c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb.....	2.00c. to 2.10c.
Rail steel bars, f.o.b. Chicago district mills, base, per lb.....	2.10c.
Common iron bars, f.o.b. Chicago, base, per lb.....	2.05c. to 2.10c.
Refined iron bars, f.o.b. P'gh mills, base, per lb.....	3.00c.
Common iron bars, eastern Pa. mill, base, per lb.....	2.10c.

Hot-Rolled Flats

Hoops, base, per lb., Pittsburgh.....	2.40c.
Bands, base, per lb., Pittsburgh.....	2.40c.
Strips, 6 in. and narrower, base, per lb., Pittsburgh.....	2.40c.
Strips, 6 to 12-in., base, per lb., Pittsburgh.....	2.20c.
Strips, 6 in. and narrower, Chicago.....	2.50c.
Strips, wider than 6 in., Chicago.....	2.40c.

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb.....	2.70c.
Screw stock and shafting, f.o.b. Chicago, base, per lb.,	2.70c. to 2.80c.
Screw stock, base, per lb., Cleveland.....	2.75c.
Shafting, ground, f.o.b. mill, base, per lb.....	3.10c.
Strips, f.o.b. P'gh mills, base, per lb.....	3.75c. to 4c.
Strips, f.o.b. Cleveland mills, base, per lb.....	3.75c. to 4c.
Strips, f.o.b. delivered Chicago, base, per lb.....	4.05c. to 4.30c.
Strips, f.o.b. Worcester mills, base, per lb.....	3.90c. to 4.15c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)	
Nails, base, per keg.....	\$2.75
Galvanized nails, 1-in. and longer, base plus.....	2.25
Galvanized nails, shorter than 1 in., base plus.....	2.50
Bright plain wire, base, No. 9 gage, per 100 lb.....	2.50
Annealed fence wire, base, per 100 lb.....	2.65
Spring wire, base, per 100 lb.....	3.50
Galvanized wire, No. 9, base, per 100 lb.....	3.10
Galvanized barbed, base, per 100 lb.....	3.45
Galvanized staples, base, per keg.....	3.45
Painted barbed wire, base, per 100 lb.....	3.20
Polished staples, base, per keg.....	3.20
Cement coated nails, base, per count keg.....	2.10
*Bale ties, carloads, to jobbers.....	75, 15 and 5 per cent off list
*Bale ties, carloads, to retailers.....	75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers.....	\$65.00

Chicago district mill prices are \$2 per ton above the foregoing and Chicago delivered prices are \$3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed (base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh.....	2.40c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills,	2.50c. to 2.55c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh.....	3.20c. to 3.30c.
No. 28 (base) per lb., f.o.b. Chicago dist. mills.....	3.40c. to 3.45c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh.....	4.25c. to 4.35c.
No. 28 (base) per lb., f.o.b. Chicago dist. mills.....	4.50c. to 4.55c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh.....	3.20c. to 3.30c.
No. 28 (base) per lb., f.o.b. Chicago dist. mills.....	3.50c. to 3.60c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh.....	4.40c.
No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....	4.75c. to 4.90c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....	4.75c. to 4.90c.
No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....	4.75c. to 4.90c.

Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills.....	\$5.50
Standard cokes, per base box f.o.b. Chicago district mills.....	5.60
Standard cokes, per base box f.o.b. Elwood, Ind.....	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh) (Per Package, 20 x 28 in.)	
8-lb. coating, 100 lb. base.....	\$11.20
20-lb. coating L. C.	17.00
25-lb. coating L. C.	18.35
30-lb. coating L. C.	20.35
40-lb. coating L. C.	
15-lb. coating L. C.	14.85

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb.,	\$2.40 to \$2.60
Large, f.o.b. Chicago, base, per 100 lb.....	2.75
Small, f.o.b. Pittsburgh.....	70, 10, 5 per cent off list
Small, Cleveland.....	70 and 10 to 70, 10 and 5 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....	\$43.00
Rails, light, billet, base, per lb.....	1.75c.
Rails, light rail steel, base, per lb.....	1.65c. to 1.75c.
Spikes, $\frac{1}{4}$ in. and larger, base, per 100 lb.....	\$2.80 to \$3.10
Spikes, $\frac{1}{8}$ in. and smaller, base, per 100 lb.....	3.00 to 3.40
Spikes, boat and barge, base, per 100 lb.....	3.25
Track bolts, all sizes, base, per 100 lb.....	2.90 to 4.25
Tie plates, per 100 lb.....	2.35 to 2.40
Angle bars, base, per 100 lb.....	3.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Steel	Iron	Galv.	Steel	Iron	Galv.
Inches	Black	Galv.	Inches	Black	Galv.
$\frac{1}{8}$	45	$19\frac{1}{2}$	$\frac{1}{8}$ to $\frac{1}{4}$	+11	+29
$\frac{1}{4}$ to $\frac{3}{8}$	51	$25\frac{1}{2}$	$\frac{1}{4}$	22	3
$\frac{3}{8}$	56	$42\frac{1}{2}$	$\frac{1}{4}$	28	11
$\frac{1}{2}$	60	$48\frac{1}{2}$	1 to $1\frac{1}{4}$	30	13
1 to 2	62	$50\frac{1}{2}$			

Lap Weld

2	55	$43\frac{1}{2}$	2	23	7
$2\frac{1}{2}$ to 6	59	$47\frac{1}{2}$	$2\frac{1}{2}$	26	11
7 and 8	56	$43\frac{1}{2}$	3 to 6	28	13
9 and 10	54	$41\frac{1}{2}$	7 to 12	26	11
11 and 12	53	$40\frac{1}{2}$			

Butt Weld, extra strong, plain ends

$\frac{1}{8}$	41	$24\frac{1}{2}$	2 to 3	61	50%
$\frac{1}{4}$ to $\frac{3}{8}$	47	$30\frac{1}{2}$	$\frac{1}{4}$ to $\frac{1}{2}$	+11	+54
$\frac{3}{8}$	53	$42\frac{1}{2}$	$\frac{1}{2}$	21	7
$\frac{1}{2}$	58	$47\frac{1}{2}$	$\frac{1}{4}$	28	12
1 to $1\frac{1}{4}$	60	$49\frac{1}{2}$	1 to $1\frac{1}{2}$	30	14

Lap Weld, extra strong, plain ends

2	53	$42\frac{1}{2}$	2	23	9
$2\frac{1}{2}$ to 4	57	$46\frac{1}{2}$	$2\frac{1}{2}$ to 4	29	15
$4\frac{1}{2}$ to 6	56	$45\frac{1}{2}$	$4\frac{1}{2}$ to 6	28	14
7 to 8	52	$39\frac{1}{2}$	7 to 8	21	7
9 and 10	45	$32\frac{1}{2}$	9 to 12	16	2
11 and 12	44	$31\frac{1}{2}$			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by $1\frac{1}{2}$ points, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and $2\frac{1}{2}$ per cent beyond the above discount.

Note—The above discounts on steel pipe also apply at Lorain, Ohio. Chicago district mills have a base 2 points less. Chicago delivered base $2\frac{1}{2}$ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to $2\frac{1}{4}$ in.	27
$2\frac{1}{2}$ to $2\frac{3}{4}$ in.	37
3 in.	40
$3\frac{1}{4}$ to $3\frac{3}{4}$ in.	$42\frac{1}{2}$
4 to $13\frac{1}{2}$ in.	46

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

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Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 51.50 per cent iron	\$4.55
Old range non-Bessemer, 51 1/2 per cent iron	4.40
Mesaba Bessemer, 51.50 per cent iron	4.40
Mesaba non-Bessemer, 51.50 per cent iron	4.25
High phosphorus iron, 51.50 per cent	4.15

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 56 per cent iron	8.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus	45c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	\$9.00 to \$11.00
Chrome ore, Indian basic, 48 per cent Cr_2O_3 , crude, per ton, c.i.f. Atlantic seaboard	22.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2 , New York	80c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt	\$3.00
Foundry coke, f.o.b. Connellsville prompt	\$4.00 to 4.25
Mine run steam coal, f.o.b. W. Pa. mines	1.50 to 2.00
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Mine run gas coal, f.o.b. W. Pa. mines	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines	1.45 to 1.50
Gas slack, f.o.b. W. Pa. mines	1.50 to 1.60

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	\$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid	115.00
Ferrosilicon, 50 per cent, delivered	\$82.50 to 85.00
Ferrosilicon, 75 per cent	145.00 to 147.50
Ferrotungsten, per lb. contained metal	90c. to 95c.
Ferrocromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered	11.50c.
Ferrovanadium, per lb. contained vanadium	\$8.50 to \$4.00
Ferrocortantium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent	\$33.00
Spiegeleisen, domestic, 18 to 19 per cent	32.00
Ferrosilicon, Bessemer, 10 per cent, \$34.50 to \$35.50; 11 per cent, \$37 to \$38; 12 per cent, \$39.50 to \$40.50; electric furnace ferrosilicon, 10 per cent, \$38; furnace with an advance of \$1 per unit for material above 10 per cent.	
Silvery iron, 6 per cent, \$23 to \$24; 7 per cent, \$24 to 25.8 per cent, \$25.50 to \$26.50; 9 per cent, \$27.50 to \$28.50; 10 per cent, \$29.50 to \$30.50; 11 per cent, \$32 to \$33; 12 per cent, \$34.50 to \$35.50.	

Fluxes and Refractories

Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	18.50
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton	18.00
Fluorspar, No. 1 ground bulk, 95 to 98 per cent calcium fluoride, not over 2 1/2 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	32.50
Fluorspar, acid lump, 98 per cent plus calcium fluoride, not over 1 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	35.00

Per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	\$43.00 to \$46.00	\$40.00 to \$43.00
Maryland	48.00 to 50.00	43.00 to 48.00
Ohio	43.00 to 46.00	40.00 to 43.00
Kentucky	43.00 to 45.00	40.00 to 42.00
Illinois	43.00 to 45.00	40.00 to 42.00
Missouri	45.00 to 48.00	38.00 to 42.00
Ground fire clay, per ton	6.50 to 7.50	7.50

Silica Brick:

Pennsylvania	40.00
Chicago	49.00
Birmingham	54.00
Silica clay, per ton	8.00 to 9.00

Magnesite Brick:

Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)	40.00

Chrome Brick:

Standard size, per net ton	42.00
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Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

Machine bolts, small rolled threads, 50 and 10 per cent off list

Machine bolts, all sizes, cut threads, 50, 10 and 10 per cent off list

Carriage bolts, smaller and shorter, rolled threads, 50, 10 and 10 per cent off list

Carriage bolts, cut threads, all sizes, 50 and 10 per cent off list

Eagle carriage bolts, 65 and 10 per cent off list

Lag bolts, 80, 10 and 10 per cent off list

Plow bolts, Nos. 1, 2 and 3 heads, 50 and 10 per cent off list

Other style heads, 20 per cent extra
Machine bolts, c.p.c. and t. nuts, 5/8 x 4 in.

45, 10 and 5 per cent off list

Larger and longer sizes, 45, 10 and 5 per cent off list

Hot-pressed nuts, blank or tapped, square, 4c. off list

Hot-pressed nuts, blank or tapped, hexagons, 4.40c. off list

C.p.c. and t. square or hex, nuts, blank or tapped, 4.10c. off list

Bolt ends with hot pressed nuts, 50, 10 and 10 per cent off list

Bolt ends with cold pressed nuts, 45, 10 and 5 per cent off list

Washers, 6c. to 5.50c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:

1/8 in. and smaller, U. S. S. 80, 10 and 5 per cent off list

5/16 in. and larger, U. S. S. 75, 10 and 5 per cent off list

Small sizes, S. A. E. 80, 10, 10 and 5 per cent off list

S. A. E. 5/16 in. and larger 75, 10, 10 and 5 per cent off list

Stove bolts in packages, 80 and 5 per cent off list

Stove bolts in bulk, 80 and 5 and 2 1/2 per cent off list

Tire bolts, 50, 10 and 5 per cent off list

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws, 80, 10 and 5 per cent off list

Milled standard set screws, case hardened, 80 and 10 per cent off list

Milled headless set screws, cut thread, 80 and 10 per cent off list

Upset hex. head cap screws, U. S. S. thread, 80, 10, 10 and 5 per cent off list

Upset hex. cap screws, S. A. E. thread, 80, 10, 10 and 5 per cent off list

Upset set screws, 80, 10, 10 and 5 per cent off list

Milled studs, 75 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	\$35.00
Forging billets, ordinary carbons	40.00
Forging billets, guaranteed analysis	45.00
Sheet bars	35.00
Slabs	35.50
*Wire rods, common soft, base, 1/2 to 1/4-in.	46.00
Wire rods, common soft, coarser than 1/2-in.	\$12.50 over base
Wire rods, screw stock	15.00 per ton over base
Wire rods, carbon 0.30 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2c.
Skelp, sheared, per lb.	2c.
Skelp, universal, per lb.	2c.

*Chicago mill base is \$50. Cleveland mill base, \$46.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E.	Series	Bars
	Numbers	100 lb.
2100* (1/2% Nickel, 10 to 20 per cent Carbon)	...\$8.00 to \$32.25	
2300 (1/2% Nickel)	4.50 to 4.75	
2500 (5% Nickel)	6.00 to 6.25	
3100 (Nickel Chromium)	8.50 to 8.75	
3200 (Nickel Chromium)	5.50	
3300 (Nickel Chromium)	7.50 to 7.75	
3400 (Nickel Chromium)	6.50 to 6.75	
5100 (Chromium Steel)	3.50	
5200 (Chromium Steel)	7.50 to 8.00	
6100 (Chromium Vanadium bars)	4.25 to 4.50	
6100 (Chromium Vanadium spring steel)	4.00 to 4.25	
9250 (Silicon Manganese spring steel)	3.50	
Carbon Vanadium (0.45 to 0.55 Carbon, 0.16 Vanadium)	4.35 to 4.50	
Nickel Chrome Vanadium (0.40 Nickel, 0.56 Chromium, 0.15 Vanadium)	4.50	
Chromium Molybdenum bars (0.50—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25	
Chromium Molybdenum bars (0.50—0.75 Chromium, 0.15—0.25 Molybdenum)	3.75	
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00	

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2 1/2-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

PERSONAL

E. P. Stenger, president Queen City Steel Treating Co., Cincinnati, was elected chairman of the executive committee of the Cincinnati chapter of the American Society for Steel Treating at the monthly meeting on May 22. Other members elected to the executive committee were: W. R. Klinkicht, Pollak Steel Co., vice-chairman; Fred L. Martin, National Metal Trades Association, secretary-treasurer; J. Culver Hartzell, J. H. Nead, C. M. Bigger, E. F. Ries and Edward Gardner. Mr. Hartzell, retiring chairman, made his annual report, showing that both the membership and the finances of the society had grown during the past year. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, read a paper on "The Manufacture and Properties of Malleable Cast Iron."

H. H. Hubbell has joined the staff of Hubbell & Sharp, iron and steel sales agents, Chemical Building, St. Louis. He was graduated from the Naval Academy at Annapolis, Md., in 1920, and served for four years as junior lieutenant. More recently he was connected with the Anderson (Ind.) plant of the Ames Shovel & Tool Co.

William K. Frank, who was elected president of the Pittsburgh Foundrymen's Association at its last meeting and will be inducted into office at the June meeting, is vice-president and general manager of the Damascus Bronze Co., Pittsburgh. He has been identified with that company since just after his graduation from Cornell University in 1911. He started as chemist and since has moved through the various departments to his present position. He is a son of Isaac W. Frank, chairman United Engineering & Foundry Co., Pittsburgh, who was one of the founders and an early president of the Pittsburgh Foundrymen's Association.

Charles R. Brown, for many years purchasing agent of the Saco-Lowell Shops, Boston, maker of textile machinery, has resigned. He is succeeded by R. J. Courtney, formerly associated with the Bethlehem Steel Co.

Horace P. Abbott, Boston Lockport Block Co., East Boston, maker of marine hardware, recently returned from an extended European trip.

Robert B. Miller, for the past six years head foreman of the East Chicago, Ind., Water Co., has been appointed plant superintendent of the Bates Expanded Steel Truss Co., East Chicago, to succeed E. J. Jenkins, resigned.

E. T. Sproull has been appointed assistant to Vice-President William M. McFate of the Trumbull Steel Co., Warren, Ohio. Mr. Sproull's duties will be of a general nature and he will retain an active interest in the sales organization. F. H. Loomis has been appointed general manager of sales and A. M. Long manager of sales in the sheet and tin department. W. J. Adamson becomes manager of sales in the hot and cold rolled strip department.

C. G. Kellogg, formerly night superintendent of the United Alloy Steel Corporation, Berger division, Canton, Ohio, has affiliated himself with the Cleveland Duplex Machinery Co. as sales engineer. He also has been general superintendent of the Bauer Brothers Co., Springfield, Ohio, and works manager of the Simplex Machine Tool Co., Hamilton, Ohio.

Walter D. Briggs, formerly associated with Henry Prentiss & Co., Inc., has joined the sales organization at the Syracuse office of Crane-Schiefer-Owens, Inc., dealer in machine tools, Buffalo.

C. A. Parliament has resigned as purchasing agent of the Chicago Hardware Foundry Co., North Chicago, Ill. He had been with the company 11 years and now assumes the duties of vice-president of the Williams Alloy Products Co., Chicago, manufacturer of bronze alloy piston rings, aluminum alloy pistons and a complete line of babbitt and bushings.

R. E. Nelles, for three years connected with the tramrail division of the Cleveland Crane & Engineering Co. as New York manager, has resigned to accept a similar connection with the Reading Chain & Block Corporation, Reading, Pa., specializing on electric and chain hoists, cranes and monorail equipment. He will represent the company in the New York district and New England States, with headquarters in New York.

G. R. Lyman, general sales manager Taylor-Whar-ton Iron & Steel Co., resigned, effective May 1. G. R. Hanks, formerly superintendent of the High Bridge, N. J., plant of the company, has been appointed assistant to the president, with full charge of sales. Stanley Apgar becomes plant superintendent.

C. E. Heil, formerly special representative for the Weirton Steel Co., Weirton, W. Va., has been elected president and treasurer of the Continental Steel Products Co., 401 Dollar Bank Building, Youngstown. The company was organized to engage in the jobbing of sheets, strip and tin plate.

Edward W. Curtis, president Curtis Machine Corporation, Jamestown, N. Y., was seriously injured in an automobile accident on the Jamestown-Dunkirk Highway May 19.

C. A. Kuebler, vice-president and general sales manager of the Duro Pump & Mfg. Co., Dayton, Ohio, has announced his resignation. For the present he will devote most of his time to business interests in Dayton and in Louisville, Ky.

William E. Vollmer, Cincinnati district sales manager of the Bourne-Fuller Co., left on May 25 for a six weeks' trip to California.

Clarence R. Falk, secretary-treasurer Falk Corporation, Milwaukee, has returned from an extensive trip to Europe and the Near East, with Mrs. Falk and their three daughters. He took occasion to study industrial conditions and expresses himself as satisfied that genuine improvement has come to European nations.

Walter H. Baker, who has been secretary, treasurer and general manager of the Universal Steel Co., Bridgeville, Pa., has been elected president in succession to the late Harry B. Duncan. He also will continue as treasurer and general manager. N. R. Baker continues as vice-president, with E. L. Stockdale as secretary and J. Howard Blair, assistant treasurer. The board of directors has been increased to seven members by the addition of Mr. Stockdale. The board now comprises Walter H. Baker, N. R. Baker, E. L. Stockdale, L. V. Martindell, C. H. Bowlby, Andrew P. Duncan and Eugene Miller, the latter having been elected to fill the vacancy created by the death of Mr. Duncan.

H. D. Church, formerly chief engineer of the truck department, Packard Motor Car Co., and for the past 18 months assistant chief engineer of the Chevrolet Motor Co., is associated with the White Motor Co. as director of engineering, and George W. Smith, formerly in charge of the experimental and research departments of the White Motor Co., has returned to the company as technical assistant to vice-president and general manager, Thomas H. White. Mr. Smith will have charge of the technical division of the staff. Mr. Church, after long service with the Packard company, joined the Hare Motors Co., where for two years he was assistant to the chief engineer and later consulting engineer, before going with the Chevrolet organization.

During the war Mr. Smith was assistant chief engineer of the Naval Aircraft Factory at Philadelphia.

W. H. Aston, managing director Aston Construction Co., Ltd., London, who has been in the United States in recent weeks, sailed for England, May 23.

J. L. Mott, of the J. L. Mott Iron Works, Trenton, N. J., sailed for Europe, May 23, on the *Leviathan*.

Benjamin Talbot, managing director of the Cargo Fleet Iron Co., Middlesbrough, England, is now in the United States. He attended the meeting of the American Iron and Steel Institute in New York last week.

Thomas F. Howe, for 12 years identified with the sales department of the Interstate Iron & Steel Co., Chicago, has been appointed general sales manager for the Republic Rolling Mill Corporation, Chicago.

B. E. Green, who has been in charge of sales for the Thomas Furnace Co., Milwaukee, for a number of years, has resigned.

F. L. Sawin, together with three associates of the Bond plant organization of the American Radiator Co.,

was given a testimonial dinner on the evening of May 22, at Hotel Lafayette, Buffalo, by company employees and officials. He entered the employ of the company in 1903 as superintendent and was subsequently appointed assistant manager.

Charles M. Schwab, chairman of the board Bethlehem Steel Corporation, will address a dinner given in his honor by the Cleveland Engineering Society at the Mid-Day Club, Cleveland, May 28. His subject will be "Engineering Ideals."

R. D. Landrum, president American Ceramic Society and for several years vice-president of the Vitrified Enameling Co., Cleveland, has been appointed general manager of the Ceramic Materials department of the Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

Walter S. Swain will become Michigan district sales manager of the Pittsburgh Screw & Bolt Co., Pittsburgh, and its subsidiary the Gary Screw & Bolt Co., Gary, Ind., as of June 1, with offices in the Donovan building, Detroit. Mr. Swain for a number of years has been associated with the Billings & Spencer Co., Hartford, Conn., and during the war was Detroit district sales manager for that company.

OBITUARY

THOMAS W. ALLISON, president Allison Steel Products Co., Inc., and president Allison & Co., both of Chester, Pa., and a director of the Delaware Valley Forge, Inc., Philadelphia, died in the Taylor Hospital, Ridley Park, Pa., May 20. He had been ill about five weeks, but it was believed not seriously, until his case became complicated and an operation for appendicitis was found necessary. Aside from being conspicuous in the business life of Chester, Mr. Allison was also the sheriff of Delaware County, having been elected in November, 1921. The position was urged upon him by those who recognized in him the qualities desired by the law observing people of his community. He was born in Philadelphia May 29, 1881, the son of William Penn and Anna Sergeant Allison. He was the founder of the Allison Steel Products Co., manufacturer of steel sash. Prior to the formation of this company he visited England and obtained there the American rights to an English type of steel sash. During the war he worked day and night on Liberty Loan drives, on committees organized for special war purposes and for the Red Cross, of which he was chairman of the Delaware County Chapter. Of the human side of Mr. Allison a great deal could be said. Outstanding were sincerity, kindness and a sympathetic nature. He was a member of many organizations, business and fraternal, including the Chester Club, which he helped to found and of which he was a past president. He is survived by his wife and a daughter.

ELBERT C. FISHER, vice-president and general manager of the Wickes Boiler Co., Saginaw, Mich., died at his home in that city May 18. He was born in Scranton, Pa., in 1865 and was graduated from Cornell Uni-



T. W. ALLISON

versity in 1890. Five years later he associated with the firm of Wickes Brothers, predecessor of the present Wickes company, formed in 1907. He was nationally known as a designer of steam boilers and was a vice-president of the American Boiler Manufacturers Association. He was a member of the council of the American Society of Mechanical Engineers and was on its boiler code committee.

HARRIS E. WAINWRIGHT, who was one of the founders of the Union Steel Casting Co., Pittsburgh, and later of the Sterling Steel Foundry Co., Braddock, Pa., died at his home in Pittsburgh, May 23, after a prolonged illness. He was born in Pittsburgh in 1874.

DOUGLAS P. COOK, president Boston Pressed Metal Co., formerly president for three years of the National Pressed Metal Association and recently elected president of the Worcester Branch of the National Metal Trades Association, died at his home in Worcester, Mass., May 26, of heart disease, aged 40 years. He was stricken on a train at Cleveland a week ago while returning from a Western business trip, but was brought home. He was born in Worcester and graduated from Harvard University in 1905. Two years later he went with the Boston Pressed Metal Co. He became vice-president and for years carried the duties of general manager and sales manager. He leaves, besides his wife and parents, two brothers and a sister.

WILLIAM ADAMS DUNSHIE, formerly president of the Duquesne Tube Works, died May 20, at Los Angeles, Cal. He was 75 years of age.

WILLIAM L. PHILLIPS, for many years general purchasing agent of the General Fire Extinguisher Co., Providence, R. I., died in that city on May 19.

JOSEPH H. CHANDLER, who for many years was special counsel in Chicago of the United States Steel Corporation and assisted in its formation, died in Pasadena, Cal., May 17, at the age of 82.

GEORGE P. DRAVO, president-treasurer George P. Dravo Co., Milwaukee, manufacturer of steam superheaters and other mechanical specialties, died May 11 after a prolonged illness. He was born in Pittsburgh and went to Milwaukee in 1895 to join the engineering staff of the Nordberg Mfg. Co., later establishing his own concern. Mr. Dravo was a life member of the American Society of Mechanical Engineers, the first president of the Milwaukee Engineering Society, and a founder and long secretary of the University Club. He was graduated from Lehigh University in 1888.

Steel Building Construction

(Concluded from page 1558)

8-in. column section weighing 32 lb. to the ft., and 15 ft. long, would in an existing railroad building be expected to carry safely a load of 86 tons; in Boston prior to 1919 it was considered safe for 52 tons; while in Philadelphia a load of only 42 tons would be allowed. The variations between the allowable loadings in different cities at present, while not so extreme as the ones just mentioned, are still troublesome.

But commercially the most unsatisfactory feature resulting from absence of uniformity in methods of design has been the opportunity it gave for securing unfair advantage, sometimes leading to less reliable structures, by an irresponsible reduction in quantity of steel to be furnished, or in plain language "skinning the job," under the protecting guise of some different code or formula. The legitimate advantage developed by a fabricator in the way of improved methods and workmanship in shop or field has too often been nullified by the absence of a common basis of design. Probably no fabricator could claim entire exemption from this practice, the effect of which is disastrous to any industry.

Realizing the need of united leadership, a number of fabricating shops became organized 2½ years ago as the American Institute of Steel Construction. Since that time its membership has grown so that today it numbers 207, and includes many of the important structural steel fabricating concerns in the United States and Canada. Its activities, limited by its constitution, have the indorsement of the United States Department of Commerce. In all of its planned improvements cooperation is welcomed from the steel mills, consulting engineers, architects, and the public at large. A four-year program has been laid out looking to the betterment of the industry.

Discussion

James H. Edwards, American Bridge Co., New York, referring to the question of recommended higher unit stresses, stated that most of the important structures of the present day have been put up under the supervision of experienced structural engineers who have become leading factors in determining the loads which those buildings might carry. In the absence of adequate guides for this work, Mr. Edwards believes that they will welcome such a standard manual as that which is under preparation by the American Institute of Steel Construction.

He pointed out that, of all the failures which have occurred in steel structures, or structures with steel frames, none, in the final analysis, has been due to the use of too high a unit stress in the design. Practically none has been due to poor material. Mostly

they have been due either to overloading or to poor design or poor workmanship or both. As the American Society of Civil Engineers has recommended an increase in the basic unit stress from 16,000 lb. per sq. in. to 20,000 lb. per sq. in., it would appear advisable to recommend the increase now, as the progress of the art and the record of service of structural steel permit it.

John Brunner, manager of the department of metallurgy, Illinois Steel Co., Chicago, referred to the former practice of differentiating between live load and dead load in building design. It now is common practice to figure everything on the one basis, which covers both conditions. He pointed out that it is an economic waste to design buildings with too low a unit stress. It is perfectly safe to use 20,000 lb. per sq. in. Therefore, the American Institute of Steel Construction is conservative in asking only 18,000 lb.

Changes in Personnel in Niles-Bement-Pond Co.

The Niles-Bement-Pond Co. and the Pratt & Whitney Co., which have maintained joint general sales and accounting departments at 111 Broadway, New York, have moved sales and accounting departments to the plants. That of the Niles-Bement-Pond Co. will be at Hamilton, Ohio, and that of the Pratt & Whitney Co. at Hartford, Conn. The general executive officers of the two companies will continue as heretofore in New York.

Several changes in personnel have accompanied this transference of departments. E. L. Leeds, general sales manager, has been appointed vice-president in charge of sales of both companies and will continue to make his headquarters in New York. Harold F. Welch, who has been New York district sales manager, becomes general sales manager of the Niles-Bement-Pond Co., and will move to Hamilton. W. P. Kirk, formerly assistant general sales manager of the two companies, has been made general sales manager of the Pratt & Whitney Co.

C. L. Cornell, vice-president, has resigned and is succeeded by C. K. Seymour, who continues as secretary of the companies. Walter R. Boom, assistant treasurer, has also resigned and has been succeeded by Arlo Wilson, who continues his former duties as special accountant. E. L. Morgan, chief accountant of the Pratt & Whitney Co. with headquarters in New York, has been transferred to the Hartford office. W. L. Burk, Jr., chief accountant of the Niles-Bement-Pond Co., has been transferred from the New York office to Hamilton.

George G. Greist, general manager of the Niles Tool Works, Hamilton, has been made general manager of the Niles-Bement-Pond Co., in charge of the Hamilton office.

Table I—Comparison (in Gross Tons) of Fabricated Structural Steel Consumed with Total Iron and Steel Produced, and with Plain Rolled Structural Shapes Produced, in the United States

Year	Total Iron and Steel Produced*	Total Plain Rolled Structural Shapes Produced*	Per Cent of Total Iron and Steel Produced	Total Fabricated Structural Steel Consumed**	Per Cent of Total Iron and Steel Produced	Per Cent of Plain Rolled Structural Shapes Produced
1892.....	6,166,000	454,000	7.4	†250,000	4.1	55
1911.....	19,039,000	1,912,000	10.0	†1,222,000	6.4	64
1912.....	24,657,000	2,846,000	11.5	1,563,000	6.3	55
1913.....	24,791,000	3,005,000	12.1	1,161,000	4.7	39
War Years						
1914.....	18,370,000	2,031,000	11.1	964,000	5.2	47
1915.....	24,393,000	2,437,000	10.0	1,335,000	5.5	55
1916.....	32,380,000	3,030,000	9.4	1,323,000	4.1	44
1917.....	38,068,000	3,110,000	9.4	1,147,000	3.5	37
1918.....	31,156,000	2,850,000	9.2	1,080,000	3.5	38
1919.....	25,102,000	2,614,000	10.4	1,030,000	4.1	39
1920.....	32,348,000	3,307,000	10.2	1,037,000	3.2	31
1921.....	14,774,000	1,273,000	8.7	656,000	4.4	51

*Production figures are rounded to nearest 1000 tons from Annual Statistical Report of American Iron and Steel Institute. A negligible percentage of iron is included.

**Consumption figures are converted into gross tons from fabricator's reports. While not absolutely complete, their substantial agreement with private records warrants their use for comparative purposes.

†Estimated.

Brittleness—Peeling—Hardness

(Continued from page 1569)

985 with 85 per cent of iron sulphide and 15 per cent of iron.

That figure is not very different from the figure given by the authors, when they said that temperatures in the neighborhood of 950 deg. were most conducive to peeling. At that temperature he presumed that, if pressure were applied, the sulphide of iron eutectic could be squeezed out in precisely the same way as Dr. Stead had shown that the iron phosphorus eutectic could be squeezed out. Some of that iron sulphide passes out into the hematite ore which surrounds the material to be annealed. The action that takes place is obscure. In some cases, if the oxide is taken and examined, interesting results may be obtained. If it is, for instance, dissolved in hydrochloric acid, there is a considerable evolution of hydrogen and of sulphuretted hydrogen. The suggestion naturally would be that the sulphur has passed freely out of the casting and gone into the hematite. But that does not always occur; it certainly does not occur always to the same extent. And the amount of sulphur that passed out is relatively small; there is nearly as much sulphur left in the malleable casting as was put into the original pig iron. It appears that the acceleration of peeling by means of sulphide of iron is due to the fact that, at about the temperature where this peeling is accelerated, the sulphide of iron is mobile and is more readily oxidized than the iron itself, and oxide of iron and sulphide of iron, more or less in mixture, are present together and help to form the peel.

Influence of Carbon

With regard to the influence of the carbon on the sulphide of iron, the authors spoke of the diffusion of the carbon and its effect upon the peel, which no doubt is an important one. But they know that the graphite separated from ordinary cast iron, when it is examined chemically, is found always to contain more or less sulphur. This leads to the suggestion that there is some kind of combination between the iron sulphide and the carbon. One wonders whether there is an iron-sulphide-carbon eutectic at a high temperature in the same way as there is an iron-phosphide-carbon eutectic. On that point there is no evidence but, if there were such a substance, no doubt it would have an influence on the reaction.

Dr. Hatfield said there is no doubt that high silicon and high temperature are largely instrumental in producing peeling. Furthermore, the sulphur content is high in all the old European malleable castings, so that one would take that as almost a constant in considering the process.

Professor Turner had asked why it was that in England irons containing a high sulphur content are used for malleable castings. Until 20 or 30 years ago the only irons available in Europe were the irons which came down the blast furnaces at certain periods, which were low in silicon and high in sulphur. If the iron was low in silicon it was high in sulphur. The malleable cast iron manufacturer must have an iron low in silicon, so he puts up with the sulphur and learns to make his malleable castings in spite of the high sulphur content; whereas in America they have iron with low sulphur and low silicon and are able to produce an indigenous malleable cast iron of great excellence. Now of course in Europe, and particularly in England, the same type of material is to be produced. He did not think peeling would be obtained with the same ease by excessive heat and high silicon with the American black heart as with the European iron.

Rate of Oxidation

Prof. W. Campbell, Columbia University, New York, said a good deal depends on the amount of manganese present. As to the rate of oxidation of the iron sulphide, iron containing iron sulphide, when heated, changes its structure in that the eutectic—previously that of iron and iron sulphide—becomes a mixture of

iron, iron oxide and iron sulphide, and the higher the manganese content, the slower this change takes place. In regard to the effect of time and temperature on this, he thought it would be necessary, sooner or later, to make experiments and continue the old work of trying to determine the equilibrium between the iron oxides, iron and carbon monoxide and carbon dioxide, at temperatures below malleableization. Somebody would have to find time to determine these equilibria at the temperatures at which they perform malleableization.

Dr. Walter Rosenhain said that, because iron and sulphur form a eutectic at a certain temperature and iron and phosphorus form another, it is therefore assumed that those corresponding eutectics will be found in a complex alloy such as cast iron. Before one can be sure of that, it is necessary to know a great deal more about the constitution of these complex systems. It takes a long time to study them, but the work is in hand, and he hoped that, in the course of a few years, we will know a little more about them. Until we do know more about them, it is a little dangerous to say, for instance, that the iron and sulphide eutectic, which normally melts at about 950 deg., is therefore likely to be freed at 950 deg. in the alloy. Of course, as a rule the addition of further elements tend to lower the temperatures at which they melt. So that the pure iron-sulphur eutectic melts at 950 deg. and, in whatever form the eutectic is present in the cast iron, it probably will melt at a somewhat lower temperature rather than a higher one. But all these reactions are extremely difficult to follow; they are very complicated; one has to be very cautious with regard to theoretical explanations of the equilibria involved. The empirical facts are of course extremely interesting and important.

De-Sulphurizing Cast Iron

With regard to the high sulphur content of cast iron, those interested in cast iron probably are aware that processes for de-sulphurizing cast iron are now being worked and, he believed, successfully, though, so far as he knew, they are not being employed for the production of malleable iron. Modern investigations are confirming Professor Turner's conclusion that the presence of sulphur does not appear to affect the mechanical properties of the iron very much. Investigators—mostly in Germany—have tried hard to show that it does, but they have failed. If sulphur is a disadvantage from a malleable point of view, it is as well to remember that there are methods of removing the sulphur quite cheaply.

Author's Closure

Douglas Ingall, in reply, said he thought that the difference between the sulphur content of the iron used for malleable work in England and that used in America is largely due to the fact that in England the iron is melted in a cupola, while in America it is melted in the open-hearth furnace [Air furnace]. As long as we have in most foundries to re-melt 50 per cent of scrap every time, it will never be possible to produce a low-sulphur iron for malleable work. Even if one starts with an iron content, say of 0.15 per cent, which might be called fairly low, by the time the foundry has dealt with it and it has been melted it would have risen to 0.35 or 0.4 per cent. We are, therefore, prevented from using the American black heart process until we have installed open-hearth furnaces in which the iron is kept from contact with the fuel and the sulphur is kept low. It can never be done while the cupola holds sway for melting.

Dealing with the percentage of manganese and the effect which it may have in preventing peeling or any other troubles in connection with malleable cast iron, it must be borne in mind that any appreciable percentage of manganese very much retards the malleableization process.

Diamond Pyramid for Hardness Testing

The following paper was read: "Some Notes on the Use of a Diamond Pyramid for Hardness Testing," by R. L. Smith and G. E. Sandland, Erith, Kent. A portion of the discussion follows:

Sir Robert Hadfield thought that chief attention

should be paid to improving the Brinell method, which is now practically the standard throughout the world. An attempt to introduce new types of scratch by the use of the diamond pyramid is very laudable, and if the authors could help to determine extremely high hardnesses, then they would be doing good service. They could consider the case of an irresistible shell striking irresistible armor plate, the point of the shell being extremely hard and the plate being extremely hard. There would be two materials of practically the same hardness, both being 650 Brinell. That is the kind of hardness that has to be considered.

Toughness-Hardness

If this scratch test would enable us to determine the toughness hardness as well as the absolute hardness, it would be doing great service. If one took two steels of exactly the same Brinell hardness, say 650, one being treated in a special way and the other just hardened, one might get very different results with regard to toughness. If a steel, although it has the same ball hardness, has greater toughness, it is naturally a very much more valuable product. The Brinell method does not in any way enable one to determine or pick out the toughness qualities of hard material; nor, as he understood, does the authors' method, excellent as it seems to be.

Hugh O'Neill said his experience with the system of hardness testing devised by the authors was that it

is an extremely sound system, and that their machine is the most comfortable hardness machine with which he had ever worked.

A. V. de Forest, Bridgeport, Conn., said a hardness-testing device has recently come into use in the United States in which the diamond indentation idea is used, and which is successful, especially with hardened materials such as the hardened tool steels. It was called the Rockwell machine. Instead of measuring a diameter of impression the measurement is of the depth, or rather, the difference between a depth at 10 kg. load and a depth at 150 kg. load. The 150 kg. load is for the harder materials. The depth is measured on a dial micrometer scheme with a needle.

There is direct reading, so that it takes less time than to transfer the specimen from the place in which it was indented to the microscope. It is also slightly quicker to read the position of the needle than to read the cross-hairs on an optical. The use of the diamond is a successful solution of the problem of the indentation tool for the higher ranges of hardness. It can be used also under the microscope, and the diameter of this indentation can be measured, if there be any need for it. It has not the advantage of the sharp corners, but it has a curious property which the authors mentioned; the cold worked materials under the microscope can be easily distinguished by the non-symmetry of the whole. There are a major and a minor diameter to the indentation.

Iron Merchant on British Pig Iron Imports

H. Arnold Wilson, managing director William Jacks & Co., Ltd., Glasgow, Scotland, pig iron and steel merchant, is in the United States on a hurried trip and will sail for home next Saturday. Mr. Wilson is making his headquarters at the office of F. W. T. Amis, 2 Rector Street, New York. Mr. Wilson's company is one of the largest handlers of steel in the Clyde shipbuilding district of Scotland and is also a large importer of pig iron.

He says that although a considerable quantity of foreign iron is coming into England and Scotland, it is still less than the amount that the British industry is exporting. Little, if any, German iron enters England, because German iron is very largely low phosphorus and British foundry practice favors iron of higher phosphorus content. Most of the foreign iron used in England and Scotland is from Belgium and Luxemburg. India is also sending a fair amount. The prices at which all foreign brands are offered have served to keep down prices in the British home market.

To Make Brass and Bronze Castings

The Detroit Aluminum & Brass Corporation has been organized with \$250,000 capital stock and will occupy the plant formerly owned by the Graham Brothers Truck Co., near Conant Road and Christopher Street, Detroit. The company has a modern plant with about 45,000 sq. ft. of floor area, situated on two and a half acres of ground, along the Michigan Central and Grand Trunk Railroads. Financial arrangements and plant equipment have been provided for large scale production. Equipment is being installed to manufacture bronze back babbitt lined motor bearings and brass, bronze and aluminum castings.

J. P. Carritte, president and treasurer of the new company, was the organizer and for several years operated the McAdamite Aluminum Co. and was also a director of the General Aluminum & Brass Mfg. Co. L. G. Hooker, vice-president and secretary, was treasurer for several years and director of the General Aluminum & Brass Mfg. Co. Philip J. Fobert, production manager of the bearing division, for several years held a similar position with the General Aluminum & Brass Mfg. Co. Paul Coskey is in charge of babbitting

operations and William M. Cooper is chief engineer. Both were for several years with the General Aluminum company. J. P. Carritte, Jr., will act as assistant foundry superintendent and metallurgist.

Bookings of Fabricated Steel Plate

While showing considerable improvement over last year, the current bookings of fabricated steel plate are much less than half those of the early part of 1923. The table, taken from a report of the Department of Commerce, shows the total for the first four months of the three years:

	1925	1924	1923
January	27,064	19,902	60,575
February	20,795	15,557	56,845
March	22,552	21,346	68,674
April	21,991	19,446	54,614
Four Months....	92,402	76,251	240,708

Of the April total in 1925, 6547 tons was for oil storage tanks, 1590 tons for refinery materials and equipments, 2361 tons for tank cars, 1460 tons for gas holders, 682 tons for blast furnaces and 9351 tons for stacks and miscellaneous uses.

French Steel Pipe Arrives for New York State Gas Line

About 1500 tons of 12-in. steel pipe, covered with jute and tar, which was purchased in France several months ago by E. Arthur Tutein, Inc., Boston, New York and Philadelphia, for the Adirondack Light & Power Co., has arrived in this country and is already on the ground in the capital district of New York State and when laid will serve to carry gas from the new by-product coke plant of the Hudson Valley Coke & Products Corporation at Troy to the municipalities of Troy, Albany and Schenectady. The purchase of this pipe a few months ago created a stir in the American trade because of the low prices obtained abroad.

Steel barrels produced in April by 30 establishments are reported by the Department of Commerce at 594,086. This is much the largest number for any month of the past two years.

Why Americans Surpass Germans

(Concluded from page 1571)

more productive by better organization and more complete conversion to mechanical operation. This is all the more important if we take into consideration that more than 80 per cent of the structural parts of machines consist of castings and it is necessary for us to overcome the great advances of our greatest rival if we desire to compete against them."

Discussion

Prof. Lohse's talk was followed by spirited discussion in which several of Germany's leading foundrymen, especially those who were familiar with American practice, took part.

The chairman of the meeting, Director Klein, first pointed out that American installations cannot be copied blindly. We must adapt them, he said, to our needs if we are to be able to utilize them. Mr. Pettin (of the Voss Works) stated that much had been heard in praise of American plants; especially the remarks of the lecturer concerning the production of 1500 cylinder heads in an 8-hr. shift. He could not quite see how an automobile cylinder could be manufactured so quickly. It does not seem imaginable that even the American machines could have such a rate of output. He also expressed the opinion that, in the admiration for the American outputs, the output of the German industry ought not to be forgotten.

Another foundryman, Mr. Bachfeld, of Düsseldorf, had made an inspection trip through the United States some 12 years ago and, in the course of several months, had become acquainted with several dozen foundries. "The plan of work is on a different basis in America from that in Germany," he said. "We must remember in the first place that America is 16 times larger than Germany but in the year 1924 had a population only two-thirds larger than Germany's. The United States contains coal, iron ore, gold and silver ores, petroleum, copper, and is blessed in full measure with these things. The roast pigeons drop in people's mouths, as it were, whereas with us luxuries must be earned by bitter toil. If we admit that in the United States large scale, mass production is the order of the day, it is due to the fact that people have better living conditions there and that the demand is much larger there. We cannot imitate this mass production in Germany as the country is much more individualized and our needs are different. Even if the production figures mentioned above are correct, we must nevertheless note that, if the foundryman will observe the quality of American castings, he will make his own conclusions."

Mr. Zerzog of Munich spoke, saying that we must not forget that foreign countries have learned a great deal from one another in recent times.

Mr. Ziegler of Frankfurt am Main had a foreman for 10 years, American-born, who had worked as a molder over there and had described the working methods in America exactly. "How do the workers get along? It has been said we should give our workmen less freedom but our workers are so closely bound to the old ways that they will not work under other conditions. An anecdote may be mentioned which is really not at all an anecdote. When the man mentioned above had worked in a foundry in the United States for 14 days, there stood near him the superintendent of his company in Massachusetts; one morning he went to the stock room to obtain something. On the way back the superintendent of the molding department told him that that was not permitted; all the material necessary must be fetched before starting work. This arrangement differs so from that prevailing with us that it alone makes more plausible the production figures mentioned."

In his reply Prof. Lohse said that conditions had changed appreciably in America from what they were 12 years ago, and that "roast pigeons no longer fly into one's mouth." It is undoubtedly to be admitted that, in carrying on construction and in accuracy, Germany compares well with America. But Germany is

behind in the feeling for practical needs and large scale productivity and considers a single product as not economical and seeks economy in general manufacture.

The presiding officer then summarized: We must understand everything in order to overcome economic difficulties, no matter what their origin, he said; we must acknowledge the facts. The figures mentioned did not seem unreasonable to the chairman. He had been across and he knew American conditions. "The American character differs from the German. They thus accomplish more in certain things than we, in others less. In certain work we shall again be first, if we try hard enough. Our efforts need to be stronger even if 'roast pigeons no longer fly into the mouth in America,' for certainly the pigeons do not fly about in Germany at all. The effort should not be confined merely to provide machinery for a large output, but to every phase of production. Good machinery alone will not suffice. We need a good average production from day to day. The machine must be reliable under constant operation and not have merely a large peak production. Operation must first be assured in order to utilize the peak capacity. We must develop our foundries to large production by improvements in operating technique. We must investigate carefully all conditions relating to raw materials, time, prices, etc., in order to arrive at frictionless, constant operation and high average production." He would like to underline the author's statement that we must strive to produce cordial cooperation. With secret small shop methods we can only drop backward in the race.

Fluorspar in 1924

Shipments of fluorspar in 1924, as reported by the Geological Survey, amounted to 124,914 net tons, valued at \$2,453,950. This showed an increase of about 3 per cent in quantity from the 121,188 tons in 1923, but there was a decrease in value of 2 per cent from \$2,505,819. The average value in 1923 is given as \$20.68 per ton, compared with \$19.65 in 1924.

About 84 per cent of the total tonnage went to steel mills in 1924, the amount having been 104,284 net tons. This tonnage was given the smallest average value, at \$17.76, of all shipments. The highest value was the \$35.05 per ton credited to the 9565 tons going into the glass, enamel and sanitary ware industries, and ranking second in point of tonnage. Foundry uses absorbed 7138 tons, while 3150 tons were used for production of hydrofluoric acid. This lineup is considerably different from that of 1923, when the steel industry received 96,713 tons, followed by 10,768 tons for glass, enamel and sanitary ware, 6976 tons for hydrofluoric acid and 3748 tons for foundry use. Exports and miscellaneous uses accounted for 777 tons in 1924, as against 2983 tons in 1923.

Imports of fluorspar in 1924 were 51,043 net tons, valued at \$10.89 per ton, compared with 42,226 tons in 1923, valued at \$10.24 per ton. About half of the amount each year came from England. British South Africa was second, with Germany a close third. These three sources provided 90 per cent of the total in 1924 and 99 per cent in 1923.

"Mahanite" a New Bearing Material

A new bearing metal to be known as "Mahanite," named for Charles B. Mahan, who discovered and developed it, is being put on the market by J. E. Loudon & Co., P. O. Box 240, Boston. The new product is announced as a slow-wearing material produced by mixing a certain combination of metals in a given order. The basis for the experiments conducted by the Boston firm in developing this bearing metal was the belief that the source of bearing trouble lay in the material and not in the lubricant. Mahanite is sold in solid bars, solid bushings and lined bushings. The solid bars are 24 in. long by $\frac{1}{2}$ in. to $1\frac{1}{4}$ in. in diameter. Other sizes and tubes are furnished to specifications.

NEW TRADE PUBLICATIONS

Short-Arc Electric Welder.—Mattice Engineering Co., 2233 Vine Street, Philadelphia. Folder describing a portable unit for welding of steel members. A second folder shows some of the work done by this method. The work includes such items as steam hammer frames, large gears, generator frames and other types of machinery.

Industrial Heating Equipment.—General Electric Co., Schenectady, N. Y. Bulletin Y-1866, dated March, 1925, has 16 pages listing applications of industrial heating equipment by character of product. There are several hundred units in the list, which gives the process, the apparatus and the rating or size of each equipment listed. Three illustrations of typical units cover a type-casting machine, an annealing furnace, and an insulation baking furnace for motor armatures, all using electricity for heating.

Pumping Water by Compressed Air.—Pennsylvania Pump & Compressor Co., Easton, Pa. The air lift method of pumping water by compressed air is discussed and illustrated in a 12-page bulletin (No. 118).

Multi-Screen Filter.—Griscom-Russell Co. Two-page folder describing a filter for keeping oil out of a boiler, and having a filter surface 350 times the area of the water inlet. The filter is made in 12 sizes, with filtering area from 385 to 13,700 sq. in.

Circuit Breakers.—Roller-Smith Co., 233 Broadway, New York. Bulletin No. 530, four pages, describes a circuit breaker which is not closable on overload. It is used for ampere capacities from 5 to 3000 in the seven sizes listed.

Direct Current Switchboard Instruments.—Roller-Smith Co., 233 Broadway, New York. Bulletin No. 400, eight pages, describes ammeters, milliammeters, voltmeters, millivoltmeters and volt-ammeters. These instruments cover the usual ranges in capacities. The bulletin gives list prices for the different ranges and sizes, and briefly describes the instruments.

Low-Pressure Oil Burner.—F. J. Ryan & Co., Philadelphia. Four-page folder describing the Mirco burner for all heating operations. The burner is described in some detail, both in text and in illustration. It is made in 12 sizes for varying capacities.

Induction Time Over-Current Relays.—General Electric Co., Schenectady, N. Y., Bulletin No. 47640.2 of 16 pages describes four forms of over-current relays, together with applications of each. Details of construction, lists of available ratings and principles of operation are covered, with illustrations from photographs, charts and diagrams.

Cold Drawn Seamless Tubing.—Edgar T. Ward's Sons, 400 Frelinghuysen Avenue, Newark, N. J. An eight-page stock list covering complete detail of sizes and the amount of each standard size of cold drawn seamless steel tubing carried at each of the following branches: Boston, Chicago, Cleveland, Detroit, Newark and Philadelphia. Sizes from $\frac{1}{8}$ in. O. D. x 21 gage to 6 in. O. D. x $\frac{1}{2}$ in. are included.

Restaurant Ventilating Equipment.—American Blower Co., Detroit. Six-page folder, showing apparatus for ventilation of restaurants and other similar buildings. The folder is illustrated and carries statistical data of pipe sizes and friction losses. Along with it are four loose sheets covering details of blowers used for this purpose.

Steam Jet Ash Conveyor.—Conveyors Corporation of America, 326 West Madison Street, Chicago. Report on Conveyor system installed in the terminal power plant of the Illinois Central Railroad at Mattoon, Ill. Cinders are discharged by the steam jet conveyor into an elevated cast iron storage tank holding 35 tons and located over a railroad siding, thus permitting easy removal of cinders when the tank becomes full.

Direct Current Generating Sets.—Engberg's Electric & Mechanical Works, St. Joseph, Mich. Catalog 105 of 32 pages (printed in three colors) deals with generating sets of engine and dynamo direct connected and furnishing direct current for use in a shop or on a ship, or other places where local power is desired. The units are designed for compactness and dependability, as they are intended for operation in many cases at points distant from expert attendance. The catalog shows installation views, details of several

types of the units, clearance and dimension diagrams, tables of dimensions, weights and other particulars and an illustrated table of spare parts.

Centrifugal Pumps.—Pennsylvania Pump & Compressor Co., Easton, Pa. Well-illustrated 16-page bulletin (No. 206), presenting its line of double suction, single stage, centrifugal pumps, also Bulletin 205 describing a close coupled centrifugal pump, suitable for brine or water service, in 1 and $1\frac{1}{4}$ in. sizes and for capacities from 10 to 45 gal. per min.

Woven Wire Fence.—Jones & Laughlin Steel Corporation, Pittsburgh. Six-page folder illustrating its standard field and poultry and rabbit fence and its various brands of barbed wire. The actual size of the wire in the various styles of fence are shown and a table details the number of strand wires, the height in inches and the approximate weight per rod.

Temperature Measuring Instruments.—Wilson-Maeulen Co., Inc., New York. Folder of four pages describes several indicating and recording temperature instruments.

Welding Electrodes.—General Electric Co., merchandise department, Bridgeport, Conn. A 16-page booklet giving full information regarding G-E welding electrodes and announcing two new types for use in electric arc welding.

Wire Forming Machines.—Baird Machine Co., Bridgeport, Conn. An 8-page bulletin devoted to Baird special machines for wire forming, also giving space to the Baird horizontal chucking machine and special types of foot presses.

Industrial Lighting.—Thompson Electric Co., 226 St. Clair Avenue, N. E., Cleveland. A small bulletin devoted to Thompson safety lowering switch or disconnecting hanger. The advantage of this device for factory lighting is said to be the ease with which the reflectors may be kept clean.

The Mult-Au-Matic in Automotive Work.—Bullard Machine Tool Co., Bridgeport, Conn. A 4-page bulletin showing the application of the Mult-Au-Matic to differential housings and gear cases.

Rivetless Chain.—Link Belt Co., 910 So. Michigan Avenue, Chicago. An illustrated booklet devoted to Link-Belt rivetless chain describing many of the uses to which this chain may be put.

Graphic Meter.—Esterline-Angus Co., Indianapolis. Bulletin 425 describes the twin-type graphic meter designed for any two standard meter elements, in which either strip charts or daily charts can be used. This occupies 30 per cent less switchboard space than two separate charts and gives two records accurately synchronized as to time.

Graphic Instruments in Industry.—Esterline-Angus Co., Indianapolis. Booklet prepared by the manager of a paper mill and dealing with the use of graphic recording instruments in the handling of manufacturing and other business matters. Illustrations show applications to a wide variety of uses.

Synchronous Motors.—Electric Machinery Mfg. Co., Minneapolis. Bulletin 875 of 8 pages and bulletin 785A, also of 8 pages, are devoted to the use of synchronous motors for driving machinery. Much information is given as to care and treatment of the motor in operation, while a list of users is given, covering many hundreds of installations in a great many States.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. Loose-leaf catalog of 64 pages covering general rules for mounting and handling ball bearings. The work is profusely illustrated with line drawings and contains a large amount of tabular matter, in addition to the charts. Calculations of bearing loads, due to gears, are developed in detail, together with a great many special cases, such as ball bearings with angular contacts, etc. Recommended sizes of bearings to fit standard sizes of motors and pulleys arranged to Electric Power Club standards are covered in a table.

Carriage Bolts and Nuts.—The Buffalo Bolt Co., North Tonawanda, N. Y. Circular in the form of an illustrated card giving data of interest in connection with two newly assorted packages of carriage bolts and nuts.

Saw Tables.—Crescent Machine Co., Leetonia, Ohio. Booklet of 20 pages, $8\frac{1}{2}$ x 11 in. devoted to a description of the company's line of saw tables, four new sizes of which are shown. Each of the eight units is completely described and dimensions are given. Illustrations, which are numerous, include details of various mechanisms.

Machinery Markets and News of the Works

RAILROAD LIST OUT

Chicago, Milwaukee & St. Paul Issues Inquiry for 20 Machine Tools

Generally Business Continues Quiet and There Is a Mixture of Good and Bad Reports

The Chicago, Milwaukee & St. Paul Railroad has inquired at Chicago for 20 items of shop machinery, this being a part of the program of rehabilitation of the road under the receivership.

Railroad buying and inquiry, though within moderate proportions, furnish the only items of interest

above the ordinary run of scattered orders for single tools. The Delaware, Lackawanna & Western is buying against its list, which has been pending a long time. The Illinois Central may buy at Chicago next week. Further inquiries from the Santa Fe and Illinois Central have helped to add a little interest in the Chicago market.

The Grand Rapids, Mich., Board of Education has asked for bids on 36 tools for technical schools.

Business is generally quiet with here and there a bright spot. But conditions are varied, good news being mixed with bad in most of the reports. The automobile industry is buying very little and the same may be said for manufacturers in other metalworking lines.

New York

NEW YORK, May 26.

A MINIMUM of activity still characterizes the machine tool market. Purchasing is light and inquiries are almost exclusively for single machines. The list of the Delaware, Lackawanna & Western is being closed, four grinders, two radial drills and two engine lathes being among the tools reported purchased. The Delaware & Hudson has closed on a 48-in., 500-ton double-end wheel press and a combination journal turning and axle lathe. The New York Central has purchased two 21-in. x 12 ft. lathes. Purchasing by industrial users has apparently been better the past week. The Ford Motor Co. bought a 44-in. side-head boring mill; the Morrison Machine Co., Paterson, N. J., a 44-in. side-head boring mill and the Newark Gear Cutting Machine Co., a 15-in. x 16-ft. lathe.

The Standard Oil Co. of New York, 26 Broadway, has awarded a contract to the H. D. Best Co., 949 Broadway, for extensions and improvements in the two-story machine shop and woodworking plant, 155 x 196 ft., at its Empire yard, Long Island City, to cost about \$50,000.

The New York Bridge and Tunnel Commission, and the New Jersey Interstate Bridge and Tunnel Commission, room 3004, Woolworth Building, New York, will receive bids until July 7, for air blast transformers, truck type oil switches and accessory equipment for the Holland tunnel, contract No. 9.

The Samro Garage, Inc., 116 Nassau Street, New York, Louis Rosenberg, president, has plans for a two-story and basement service, repair and garage building, 75 x 100 ft., at 413-19 West Forty-Fifth Street, to cost about \$65,000. William Shary, 22 East Seventeenth Street, is architect.

The Phelps-Dodge Corporation, 99 John Street, New York, has plans for extensions and improvements in its Copper Queen reduction works, Douglas, Ariz., including the installation of hearth roasters, waste heat boilers and additional reduction machinery, estimated to cost \$1,000,000. G. H. Dowell is manager at the plant.

The G. A. Schacht Motor Truck Co., Eighth and Evans Streets, Cincinnati, has awarded a general contract to the William F. Kenny Co., 44 East Twenty-third Street, New York, for its proposed one and two-story branch factory at Long Island City, 180 x 180 ft., estimated to cost \$200,000 with equipment. Zettel & Raop, Mercantile Library Building, Cincinnati, and Leslie Walker, 144 East Fifty-fourth Street, New York, are architects. William Schacht is president.

The Knickerbocker Ice Co., 45 East Forty-second Street, New York, has plans for a one-story addition to its ice-manufacturing plant on Collins Place, Flushing, L. I., to be

120 x 150 ft., estimated to cost \$175,000 with equipment. Charles Small is president.

John Marsa, operating an automobile service and garage building at 441 West 167th Street, New York, has acquired 12,500 sq. ft. at Riverside Drive, 134th Street and Twelfth Avenue, as a site for a seven-story service, repair and garage building, to cost \$400,000, designed to accommodate 1000 cars. It will be erected by the John Marsa Construction Co., an affiliated organization.

The Brooklyn-Manhattan Transit Corporation, 85 Clinton Street, Brooklyn, is arranging a fund of \$300,000 for the installation of block signals and interlocking and miscellaneous signal devices on its Fulton Street and West End elevated lines. The work will be carried out in connection with a proposed fund of \$2,000,000 for new construction and improvements this year.

Margon & Glaser, 2804 Third Avenue, New York, architects, have plans for a five-story automobile service, garage and repair building, 25 x 112 ft., at 208 West Seventy-seventh Street, to cost \$80,000.

The Camp Smith National Guard, Camp Smith, Peekskill, N. Y., has plans for a one-story ice-manufacturing plant, 40 x 100 ft., to cost about \$25,000.

The Union Bag & Paper Corporation, Woolworth Building, New York, is planning for an increase in capacity at its hydroelectric power plant at Hudson Falls, N. Y., totaling about 45,000 hp., resulting from the proposed regulation of waters of the Hudson River by the State in this district. It is said that the additional output will be used by the Adirondack Power & Light Co., Amsterdam, N. Y.

E. A. Wildermuth, 1061 Atlantic Avenue, Brooklyn, manufacturer of automotive electric equipment, radio apparatus, etc., has plans for a four-story factory, 68 x 100 ft., estimated to cost \$125,000 with equipment. Adolph Goldberg, 164 Montague Street, is architect.

The Board of Supervisors, Court House, White Plains, N. Y., has completed plans for an addition to the power house at the Grasslands Hospital, Mount Pleasant, including improvements in the present plant, with additional equipment, estimated to cost \$50,000.

The Gulf Refining Co., 21 State Street, New York, has filed plans for three one-story buildings at its oil storage and distributing works, Ingraham Avenue, Bayonne, N. J., to cost about \$20,000.

George La Monte & Son, 299 Kingsland Road, Nutley, N. J., manufacturer of paper products, has plans for a one-story addition to its power house to cost \$38,000. The Fletcher-Thompson Co., 542 Fairfield Avenue, Bridgeport, Conn., is architect and engineer.

Fire, May 18, destroyed a portion of the nickel department at the plant of the American Smelting & Refining Co., State Street, Perth Amboy, N. J., with loss estimated at \$20,000. The company will rebuild at once.

The Crane Market

NEW inquiry for cranes is light, but business pending and continued development of requirements in overhead equipment lead to the expectation of a fair degree of activity for the next few weeks. Inquiry for locomotive cranes is still small with no early increase in demand expected. An overhead crane inquiry has appeared from the Lehigh Valley Railroad, New York, calling for a 30-ton, 40-ft. span gantry crane. Bishop, Friedman and Bergstrom, New York, are reported asking for prices on a 5-ton, long span crane, either new or second hand. Sanderson & Porter, New York, are reported to have closed on a 100-ton crane and several tainter gate hoists for a power company in Pennsylvania. The Pennsylvania Railroad is reported to have inquired for another overhead crane in the past week.

Few new inquiries have been received in the Pittsburgh district and action on pending business is slow. The West Penn Power Co., has purchased a 100-ton crane bridge and a 125-ton trolley for old installations and is in the market for a 25-ton crane. A number of cranes for the Homestead works of the Carnegie Steel Co. are still pending.

The Eastern New Jersey Power Co., Allenhurst, N. J., will expend close to \$275,000 for the proposed extensions and improvements in its local steam-operated power plant and the installation of additional machinery.

The Collway Foundry, Inc., Newark, incorporated the past week with a capital of 1000 shares of stock, no par value, has purchased the local plant of the Laytham Foundry, Oraton Street and Grafton Avenue, including equipment and fixtures. The new owner will improve the foundry and install additional equipment for the production of special white metal and other castings. The company is headed by William D. Bingham and Robert J. O'Brien, 35 Grafton Avenue.

The Art Store Fixture Mfg. Co., Inc., 59 Pioneer Street, Newark, manufacturer of store fixtures and equipment, has plans for a new two-story factory, 76 x 90 ft., at 831-37 Frelighuysen Avenue, to cost \$40,000. Eugene A. McMurray, Aldene Building, is architect.

M. D. Goodman, 185 Bigelow Street, Newark, N. J., is in the market for arc and spot welders.

The U. S. E. Corporation, 310 Vernon Avenue, Long Island City, N. Y., is looking for a V. & O. No. 63 push press.

Peter Grassman & Co., Inc., manufacturer of radio instruments, has established an office at 366 Madison Avenue. It is probable that the company will manufacture instruments at some future time.

The Metal Craft Co., 306 East Fortieth Street, New York, has incorporated with \$20,000 capital stock to manufacture metal specialties, dies, tools and special machinery. It has acquired a business in this line.

The Crilly Mercury Anti-Friction Metal Corporation, Newark, N. J., has been organized to manufacture a new anti-friction metal for making bearings. It will produce the rough castings and will distribute through the Mutual Iron Works, Jersey City, N. J. The metal is said to have undergone several tests and has been favorably reported by the Department of Commerce, Bureau of Standards, Ottawa, Canada. Address Thomas Cantillo, 142 Market Street, Newark.

The Paramount Plumbing & Heating Supply Corporation, 262 West 145th Street, New York, has established a jobbing house in plumbing and heating supplies. It is in the market for necessary materials. H. Resnicow and S. Samuels are the principals.

The Beach Carburetor Co., 301 Cortlandt Street, Belleville, N. J., recently incorporated, is a manufacturer of carburetors for internal combustion motors. It also manufactures solid metal floats. R. H. Beach is one of the principals.

The Hiler Audio Corporation, 10 Argyle Terrace, Irvington, N. J., has been incorporated to manufacture radio equipment. Work will be done by another company for the present. E. E. Hiler is secretary.

The E. J. Maier Corporation has sold the Latham Foundry, Oraton Street and Grafton Avenue, Newark, N. J., along with buildings and equipment, to the Collway Foundry, Inc., which will use the plants to manufacture a new white metal.

The Cuddy Electric Supply Co., 243 West Fayette Street, Syracuse, N. Y., has been organized as wholesaler of electrical equipment, radio supplies and power apparatus. E. M. Cuddy is president.

The Chicago, Milwaukee & St. Paul is inquiring for a 15-ton, 80-ft. span floor operated overhead traveling crane.

Among recent purchases are:

Phoenix Utility Co., 71 Broadway, New York, a 125-ton, 48-ft. span, 4-motor overhead crane for Siegfried, Pa., from an Eastern crane builder, a 120-ton gate hoist from an Illinois builder and a 165-ton gate hoist from a Boston, Mass., builder, and a 20-ton gate hoist from the American Crane Co., all for the Cutler hydroelectric project.

Dwight P. Robinson & Co., New York, two 25-ton electric overhead cranes for the Clinchfield Railroad, from Manning, Maxwell & Moore, Shaw Electric Crane works.

York Mfg. Co., York, Pa., a 30-ton, 55-ft. 8-in. span electric crane, from Manning, Maxwell & Moore, Shaw Electric Crane works.

Pennsylvania Railroad, three 3-ton monorail hoists, reported purchased from the Shepard Electric Crane & Hoist Co.

Brewster Construction Co., New York, a 30-ton used Brownhoist locomotive crane with 2-cu. yd. bucket from Philip T. King, 50 Church Street, New York.

Philadelphia

PHILADELPHIA, May 25.

CONTRACT has been awarded by the Steel Heddle Mfg. Co., Twenty-first and Allegheny Streets, Philadelphia, manufacturer of textile mill equipment, to the William Steele & Sons Co., for an addition to cost approximately \$100,000 with machinery.

Max Bernhardt, 721 Walnut Street, Philadelphia, architect, has plans for a two-story automobile service, repair and garage building, 80 x 225 ft., to cost approximately \$85,000.

The Samuel J. Cresswell Iron Works, Twenty-third and Cherry Streets, Philadelphia, has awarded a general contract to Mitchell Brothers, 2125 Race Street, for a one-story foundry to cost \$15,000.

The Philadelphia Rapid Transit Co., 810 Dauphin Street, Philadelphia, has asked bids on a general contract for an addition to its car house and shop, including improvements in the present structure.

Fire, May 21, destroyed a portion of the central building at the plant of the Certain-Teed Products Corporation, Second and Erie Streets, Philadelphia, manufacturer of roofing, oil cloth, etc., including a portion of the coating and drying division, with loss reported at \$200,000 including equipment. It is planned to rebuild.

The Philadelphia Storage Battery Co., Ontario and C Streets, Philadelphia, has awarded a general contract to the Stewart Brothers Co., 2526 North Orkney Street, for an addition to its plant to cost \$50,000 with equipment.

The former plant of the Haverford Cycle Co., 1002-4 Buttonwood Street, Philadelphia, has been acquired by N. W. Illoway, Philadelphia, and associates. It consists of a seven-story structure on site 41 x 160 ft., and will be occupied by the new owners, it is stated, for mechanical production, although no definite announcement has as yet been made.

The Mack International Motor Truck Co., 25 Broadway, New York, has filed plans for a new service and repair branch at Torresdale Avenue and N Street, Philadelphia, for which a contract recently has been let to the Nelson-Pedley Construction Co., Inc., 1510 Chestnut Street. It will cost approximately \$175,000 with equipment.

The Colonial Electric Co., Inc., 932 Arch Street, Philadelphia, has acquired the three and four-story buildings at 240-44 North Tenth Street, and three-story structure at 1007-9 Winter Street, for headquarters and expansion.

The Philadelphia Nash Motor Co., Broad and Thompson Streets, Philadelphia, local representative for the Nash automobile, has filed plans for a new service and repair branch on Longshore Street, Tacony. It has purchased the five-story building now occupied at first location noted, 75 x 165 ft., and will use as local headquarters, including service and repairs.

Huff Daland & Co., Ogdensburg, N. Y., manufacturers of airplanes and parts, have concluded negotiations for the purchase of a portion of the former shipyard of the Merchants' Shipbuilding Corporation, Bristol, Pa., totaling about 30 acres with buildings, and will establish a new plant.

Fire, May 22, destroyed the entire plant of the Panelite Board Co., Enterprise Avenue, Trenton, N. J., manufacturer of wallboard products, paperboard, etc., with loss estimated

at \$200,000 with machinery. It is planned to rebuild. D. Manson Sutherland is president.

The John E. Thropp Sons Co., Trenton, N. J., manufacturer of rubber mill machinery and general machinist, has awarded a general contract to Henry E. Baton, Inc., 1713 Sansom Street, Philadelphia, for a new one-story plant to cost about \$45,000.

The Hastings Battery Service & Sales Co., 600 Wyoming Avenue, Scranton, Pa., will soon ask bids for a two-story repair and service building, 40 x 120 ft., to cost about \$30,000 with equipment. Herman C. Rutherford, 316 North Washington Avenue, is architect.

Foundations are being laid for the proposed plant of the Van Why Auto Body Works, Inc., Stroudsburg, Pa., on site lately acquired at Bethlehem, Pa. It is reported to cost about \$40,000. The present Stroudsburg works will be removed to the new location and additional equipment installed.

Fire, May 20, destroyed a portion of the pattern department at the plant of the Traylor Engineering Co., Allentown, Pa., manufacturer of cement mill equipment and other heavy machinery, with loss estimated at \$80,000. The structure was 25 x 200 ft. It is planned to rebuild.

The Board of Education, Allentown, Pa., plans the installation of manual training equipment in its proposed three-story senior and junior high school at Second and Turner Streets, estimated to cost \$390,000, for which bids will be asked soon on general contract. Jacoby & Everett, Commonwealth Building, are architects.

The Nickeloid Co., Walnutport, Pa., manufacturer of nickel and other metal goods, will begin the erection of a one-story addition, 45 x 80 ft.

The Charles Warner Co., Wilmington, Del., operating sand, gravel and lime plants, has acquired a controlling interest in the American Lime & Stone Co., with lime plant at Bellefonte, Pa., and crushing plants at this same place, Tyrone and Hollidaysburg, Pa. The new owner is said to have expansion plans under consideration, including improvements in present plants and additional equipment.

The York City School Board, West King Street, York, Pa., will take bids on a general contract until June 15 for a two-story and basement industrial high school, 232 x 245 ft., to cost close to \$1,000,000 with equipment. J. B. Hamm, City Bank Building, is architect. Henry Adams, Calvert Building, Baltimore, is mechanical engineer.

The Super-Compression Engine Co., care of Walter S. Taylor, Wilmington, Del., has been organized with capital of \$100,000 to manufacture engines, machinery and parts. Present manufacturing facilities are adequate.

The W. T. Ebur Co., Williamsport, Pa., has been organized with a capital of \$25,000 to operate a foundry to manufacture a general line of gray iron castings. Equipment is adequate for the present.

The Warwick Steel & Iron Breaking Co., Baer Building, Reading, Pa., will buy a used 50 to 100-hp. Economic boiler, locomotive type.

The Alloy Metal Wire Co., Moore, Pa., is inquiring for three cold rolling mills and one squaring shear.

South Atlantic States

BALTIMORE, May 25.

PLANS are being completed by the A. Weiskittel & Son Co., Twelfth and East Lombard Streets, Baltimore, manufacturer of stoves, stove castings, etc., for rebuilding the portion of its plant destroyed by fire May 17, with loss including two foundry units, engine room, glass blowing works and other structures, estimated at \$200,000 with equipment. Henry C. Weiskittel is president.

The Bartgis Brothers Co., 6 South Greene Street, Baltimore, manufacturer of paper boxes and containers, has leased the plant of the J. C. Eichman Mfg. Co., manufacturer of plumbing equipment and supplies, and will take over the property on Sept. 1. It will be remodeled, the present factory will be removed to the new location and additional machinery installed. The Eichman company proposes to construct another plant at once on adjoining site, to provide increased capacity over the present plant.

The Mack International Motor Truck Co., 2828 Greenmount Avenue, Baltimore, is reported to be completing plans for the erection of a new service and repair building on local site, to cost \$200,000 with equipment.

The Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., has preliminary plans for two additional hydroelectric power units at its Stevens Creek power property, each to be equipped for a capacity of about 3000 hp.

estimated to cost \$350,000. The J. G. White Engineering Corporation, 43 Exchange Place, New York, will be in charge of the project.

The Clarence Chair Co., Asheboro, N. C., will erect a new plant, 60 x 150 ft., and 60 x 100 ft., to cost about \$65,000. E. D. Cranford heads the company.

The Littiston Harvester Co., Albany, Ga., is said to be planning the early rebuilding of the portion of its foundry and shops recently destroyed by fire. It will cost approximately \$25,000.

The Alleghany Slag Products Co., Buena Vista, Va., has inquiries out for a tube or rod mill with capacity of 5 to 10 tons per hr.

Taylor Brothers, 616 East Main Street, Richmond, Va., are in the market for machinery for the production of agate or glass marbles.

Ovens, power equipment, conveying and other machinery will be installed in the proposed four-story plant to be erected at Baltimore, by the General Baking Co., 342 Madison Avenue, New York, estimated to cost \$500,000. C. L. Comstock, 110 West Fortieth Street, New York, is architect and engineer.

Alter & Kolker, 121 East Street, Baltimore, operating a general millwork plant, have plans for a one-story addition, 50 x 110 ft. The business is also operated under the name of the Maryland Lumber Co.

The Pekor Iron Works, Inc., foot of Ninth Street, Columbus, Ga., recently incorporated with a capital of \$25,000, will erect a one-story plant, 50 x 60 ft., and 23 x 30 ft., for the manufacture of throttle valves and other steam engine equipment. A machine shop will be installed, for which orders are being placed for tools. R. B. Pekor is secretary.

The Waters-Sparks Motor Co., Macon, Ga., has leased a two-story building to be erected by the Central of Georgia Railway Co., at Broadway and Express Alley, for a new service, repair and garage building, estimated to cost \$150,000 with equipment.

The United States Coast Guard Headquarters, Washington, is asking bids until June 15, for two 90-hp. four-cycle air injection Diesel engines and appurtenances for electric generator sets; also one oil engine for generator set for the coast guard cutter, Bear.

The Hackley-Morrison Co., Inc., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for a 40 to 60-hp. oil engine; dragline bucket, Page type, $\frac{3}{4}$ -yd. capacity; one sectional cast iron boiler, about 1500 sq. ft. surface; one double end, motor-driven tool grinder, stand or bench type, suitable for a 12-in. diameter emory wheel; one 30 to 50-kw. alternator, belt-driven or direct-connected to oil engine; one 2300-volt compensator for 300-hp. squirrel cage motor, and 20-in. belt conveyor, mounted on steel frame, about 50 ft. long, motor-driven.

The Board of Education, Staunton, Va., plans the installation of manual training equipment in its proposed high school, estimated to cost \$200,000, for which plans are being drawn by William B. Ittner, Board of Education Building, St. Louis. T. J. Collins & Sons, Staunton, are associated architects.

The Gulf Refining Co., Gulf Building, Houston, Tex., is planning to rebuild the portion of its storage and distributing plant at Greenwood, B. C., recently destroyed by fire with loss of \$30,000 including equipment.

The Aero Shock Absorber Co., Brevard, N. C., recently organized, has leased a building and will establish an assembling plant for automobile shock absorbers, with equipment for an initial daily output of 150 sets. For the present, parts will be produced under contract. M. A. C. Johnson is secretary.

The International Cement Co., 1834 Broadway, New York, is pushing construction of its new mill at Norfolk, Va., and proposes to have the plant ready for operation during the summer. It will have a rated capacity of 1,000,000 bbl. per year and will cost in excess of \$500,000.

The Walker Machine & Foundry Co., Roanoke, Va., is planning to rebuild the portion of its works recently destroyed by fire. An official estimate of loss has not been announced. Additional equipment will be installed. L. Franklin Moore is president.

The Modern Household Appliance Co., 105 Light Street, Baltimore, has been organized as a subsidiary of the B. C. Bibb Stove Co., Baltimore. It was formed essentially as distributor of two new products of the Bibb company. C. Gordon Pitt is president.

Charles D. Bridgell, Inc., 816-820 West Main Street, Crisfield, Md., incorporated with \$200,000 capital stock, plans an enlargement of a business, manufacturing tongs, knives and other hardware specialties. Mr. Bridgell is president.

Pittsburgh

PITTSBURGH, May 25.

A FAIRLY good movement of special purpose machines is noted in this district, but a slow business in standard tools. The demand for equipment especially adapted to individual requirements has been growing steadily for the past two or three years. The Westinghouse Electric & Mfg. Co. continues to close against its second quarter list. The Chesapeake & Ohio is inquiring for about a dozen machines. Sales of single tools are fairly numerous and on the whole, machine tool business in this district may be said to be reasonably good.

Foundations will soon be laid for the proposed two-story and basement plant of the Auto Truck Equipment Co., 7511 Penn Avenue, Pittsburgh, to cost \$50,000, for which a general contract has been let to the Taylor-Meyer Co., Keystone Building. Walter H. Stuben, 101 Market Street, is architect. A. M. Hauger is president.

The Rainey Tool Co., Grove City, Pa., manufacturer of special tools, has leased a building, 50 x 55 ft., to be erected by W. A. Firm, Grove City, on the site of the former plant of the Grove City Body Works, destroyed by fire several months ago. The Rainey company purposed to remove its present plant to this location and will install additional equipment.

Fire, May 20, destroyed the tipple at the plant of the Carnegie Coal Co., Bulger, vicinity of Washington, Pa., with loss of \$100,000 including equipment. The building housing the mining machinery was also destroyed. Tentative plans are said to be under advisement for rebuilding. Headquarters of the company are in the Oliver Building, Pittsburgh.

W. E. Moore & Co., Union Bank Building, Pittsburgh, engineers, have awarded contract to the W. N. Kratzer Co., 3212 Smallman Street, for a one-story and basement plant, 100 x 200 ft., to cost \$32,000. W. E. Moore is president.

The South Penn Oil Co., Union Trust Building, Charleston, W. Va., is considering plans for a new gasoline extraction plant at Witcher, W. Va., with main one-story building, 75 x 150 ft., and one-story boiler shop, 40 x 40 ft., estimated to cost approximately \$70,000.

The New York Central Railroad Co., New York, has purchased about 180 acres at Nitro, W. Va., as a site for new locomotive and car repair shops. It is proposed to remove the present works at Dickinson, near Charleston, W. Va., to this location. The plant will have facilities for the employment of about 200 men.

Fire, May 15, destroyed a portion of the lumber and sawmill of the Babcock Coal & Coke Co., Fayette County, W. Va., affiliated with the Babcock Lumber Co., Frick Building, Pittsburgh, with loss of \$200,000 including machinery. It has been giving employment to about 300. Plans are under advisement for rebuilding.

The Bessemer Gas Engine Co., Grove City, Pa., will erect two additions to its plant, comprising a construction shop for Diesel oil engine production and a building for the manufacture of steel forgings, each one-story. The expansion will cost approximately \$200,000 with equipment.

The Consolidated Ice Co., Thirteenth and Pike Streets, Pittsburgh, has tentative plans for the rebuilding of the portion of its plant destroyed by fire May 17, with loss estimated at \$50,000 including equipment.

Buffalo

BUFFALO, May 25.

PLANS have been filed by the Henbusch Co., 656 Genesee Street, Buffalo, manufacturer of metal products, for a one-story addition to cost about \$25,000.

The City Council, Niagara Falls, N. Y., has awarded a general contract to Ralph Jackson, 619 Third Street, for a one-story municipal machine shop and service garage for city cars, 70 x 200 ft., to cost approximately \$30,000. E. B. Moes, City Hall, is architect.

The Olean Electric Light & Power Co., Olean, N. Y., has applied for permission to construct and operate a new power plant at Leon, N. Y.

The United States Gypsum Co., Oakfield, near Batavia, N. Y., has plans for three additions, including a paper mill, power plant and general storage and distributing building, to cost about \$100,000 with equipment. Headquarters of the company are at 205 West Monroe Street, Chicago.

The Lockport Light, Heat & Power Co., Lockport, N. Y., has plans for a three-story addition to its works to cost \$70,000. Contract for building has been let to Brass Brothers, 110 Whitney Avenue, Niagara Falls, N. Y.

The Western New York Electric Co., Jamestown, N. Y., is planning for extensions in its electric power plant at Humphrey, N. Y., and the installation of additional equipment.

The Wicker Lumber Co., 1516 Lockport Street, Niagara Falls, N. Y., has awarded a general contract to Wright & Kremer, Main and Pine Streets, for a new one-story mill and shop, 180 x 190 ft.

The Tonawanda Power Co., Tonawanda, N. Y., has plans for a one-story power plant, 30 x 65 ft. Johnstone & Eggert, 16 Webster Street, are architects.

The Erie Railroad Co., 50 Church Street, New York, has acquired property west of Jamestown, N. Y., upon which it will erect a locomotive roundhouse and repair shop.

New England

BOSTON, May 25.

SALES of machine tools in this market are holding fairly well and it is believed that most dealers will have disposed of more machinery this month than in April. Business is still below normal, however. Some houses report an increase in inquiries, but other state prospects have fallen off. One of the largest Massachusetts industries is asking for prices on a fairly extensive list of machinery for the purpose of making up its budget for the last half of 1925. One railroad is asking for quotations on three or four machines, but inquiries otherwise concern single tools, usually rebuilt and at prices mostly below those quoted by the trade. Included in sales reported for the past week are: A 90-in. journal turning lathe, universal bench milling machine, vertical grinder, a 36 x 36 x 10 ft. planer, all new tools; a small used lathe, upright drill and a grinder, and a 24-in. used lathe.

Plans are ready for figuring on a one-story, 49 x 215 ft. plant for the New England Tank & Tower Co., Everett, Mass. Plans are private.

Bids closed last week on a five-story and basement, 50 x 120 ft. trade school addition on Prescott Street, at Worcester, Mass. L. W. Briggs, 314 Main Street, is the architect.

Bids closed last week on a one-story addition to the manufacturing unit of the Air Reduction Sales Co., 122 Mount Vernon Street, South Boston. Francisco & Jacobus, 511 Fifth Avenue, New York are the architects.

The Roubaix Mills, Inc., Clinton, Mass., propose to start the erection of a machine shop to replace that destroyed by fire last week. Details have not been completed.

Contract has been let by the Clark Brothers Co., Milldale, Conn., manufacturer of bolts, nuts, rivets, etc., to the Immick Co., Meriden, Conn., for a one-story addition, 46 x 125 ft. Walter T. Arnold, Meriden, is architect.

Tileston & Hollingsworth, 49 Federal Street, Boston, manufacturers of paper products, have awarded a general contract to the Morton C. Tuttle Co., Park Square Building, for a two-story and basement addition, 100 x 120 ft., at the Hyde Park plant, and a second two-story structure.

Fire, May 21, destroyed a portion of the plant of the Folsom Woodworking Mills, Dover-Foxcroft, Me., with loss of \$50,000 including equipment. Plans for rebuilding are under consideration. John Folsom is head.

Morris Levinson, Newburgh, N. Y., and associates have acquired the former plant of the Pendleton Shipyards, Mystic, Conn., for \$30,000, devoted in previous years to the construction of wooden vessels. The new owners have not as yet announced plans for operation.

The Fellows Gear Shaper Co., Springfield, Vt., has plans under way for a two-story addition, 30 x 60 ft., for the pattern department. E. R. Fellows is president.

The Aldrich Brothers Co., Moosup, Conn., is completing plans for a new machine shop at its textile mill, in connection with expansion in other departments to cost in excess of \$75,000.

Fire, May 21, destroyed a portion of the former plant and yards of the Narragansett Shipbuilding Co., Portsmouth, R. I. An official estimate of loss has not been announced.

The Patent Button Co., Brown Street, Waterbury, Conn., manufacturer of metal-snap buttons, etc., is considering the erection of a new factory to double, approximately, the present output. L. J. Hart is president.

The United Electric Co., 73 State Street, Springfield, Mass., has plans for an automatic power substation on Wilbraham Avenue, to cost about \$42,000. McClintock & Craig, 33 Lyman Street, are architects.

The Eastern Dairies, Inc., Danielson, Conn., recently organized with a capital of \$5,000,000, as an interest of the Dolbey Ice Cream Co., Providence, R. I., and associated companies, contemplates the erection of a local refrigerating and cold storage plant in connection with a proposed distributing works. A steam power house will also be built. Samuel Dolbey is one of the heads of the company.

The Dennison Pipe Organ Co., Reading, Mass., has awarded contract to the Austin Co. for a one-story plant, 40 x 110 ft., with extension, 30 x 40 ft. D. F. Dennison is president.

The Lynn Die Co., 9 City Hall Square, Lynn, Mass., has filed plans for a new one-story factory to cost about \$10,000.

J. Murray Howe, 10 State Street, Boston, and associates have had plans approved for a new automobile service, repair and garage building at 13-27 Cambridge Street, to accommodate 850 cars, and will begin work soon. It will cost close to \$1,000,000 with equipment.

The Hart & Cooley Co., Inc., New Britain, Conn., manufacturer of warm air registers, etc., has awarded a general contract to the William H. Allen Co., Inc., Hungerford Court, for a one-story addition, 60 x 175 ft.

The Narragansett Electric Lighting Co., Providence, R. I., has plans for a four-story addition to its new power house on Eddy Street, 25 x 29 ft. Jenks & Ballou, Grosvenor Building, are architects and engineers.

The Atwater Mfg. Co., Southington, Conn., manufacturer of drop forgings, has awarded contract to the H. Wales Lines Co., Meriden, Conn., for a one-story addition to its steam power house.

Chicago

CHICAGO, May 25.

FRESH railroad inquiries continue to be the main feature of the market situation, which is otherwise rather quiet. The Chicago, Milwaukee & St. Paul has issued a list of 20 machines, and additional inquiries have been added to the pending lists of the Illinois Central and the Santa Fe. The Illinois Central has asked for figures on a 20-in. x 10-ft. tool room lathe, a 20-in. x 10-ft. heavy duty engine lathe, and a 4-in. heavy turret lathe, all motor-driven. The Santa Fe has put out inquiries for a 32-in. shaper, a 24-in. x 12-ft. engine lathe, and a 36-in. x 36-in. x 12-ft. planer, all motor-driven. Prompt action is expected on the St. Paul list and it is now believed that the Illinois Central will close for at least part of its tools next week. Industrial buying is confined to scattered orders for one or two machines. The Grand Rapids, Mich., Board of Education has closed for 36 machine tools to be installed in two schools.

*Chicago, Milwaukee & St. Paul List
(All machines to be motor-driven; good used tools
will be considered)*

One 90-in. back-geared driving wheel lathe.
One 18-in. x 8-ft. engine lathe.
One 24-in. x 12-ft. engine lathe.
One 36-in. x 18-ft. engine lathe.
One 32-in. shaper.
One 44-in. boring mill.
One 2-in. turret lathe.
One 72-in. radial drill.
One 42-in. vertical drill press.
One 20-in. Barnes stationary head drill.
Three double 12-in. emery grinders.
One 1500-lb. steam hammer.
One 48-in. punch and shear to punch 1-in. hole
through 1-in. steel.
One power hack saw.
One double head bolt cutter.
Two 300-amp. electric welders.
One Whiting driver drop pit table.
One 3000-lb. electric crane truck similar to
Baker R. & L. or Elwood-Parker.

The Blackhawk Foundry Co., Davenport, Iowa, has awarded contract for a one-story foundry addition, 48 x 74 ft., to cost \$5,400.

The American Oven & Machine Co., 1506 Fulton Street, Chicago, has purchased a tract, 124 x 249 ft., on the corner of Flournoy Street and California Avenue as a site for a new plant.

The Arthur Composition Vault Co., Arthur, Ill., will erect a new plant.

A plant will soon be built at Hoopeston, Ill., to house a factory of John Green & Sons, manufacturers of reballitting jigs for use in garages and motor vehicle repair shops.

The Automatic Storm Sash Lifter Co., a new organization, has started operations in a factory at St. Cloud, Minn. A patented storm sash lifter is being manufactured.

William Schukraft & Son, builders of motor truck bodies, 943 Fulton Street, Chicago, are starting the construction of a plant to contain 112,000 ft. of floor space on the corner of Washington Boulevard and Ann Street, to cost \$350,000.

The Chicago-Wilcox Mfg. Co., manufacturer of gaskets, has moved its offices and factory from 7029 Stony Island Avenue to a new plant at Seventy-seventh Street and Anthony Avenue.

The Beckwith Iron Works, 540 West Seventh-ninth Street, Chicago, has had plans prepared by Frank J. Saridakis, 37 West Van Buren Street, for the first unit of a plant, 85 x 200 ft., at 9100 State Street, to cost \$50,000. The complete works will cost over \$100,000.

The Brockman Co., manufacturer of furniture, 2255 Ward Street, Chicago, has awarded a contract for a three-story factory, 50 x 69 ft., 2249-53 Ward Street, to cost \$20,000.

The Super-Safety Electric Co., 1219 West 103rd Place, Chicago, recently chartered, is an incorporation of a former company of the same name. It manufactures an electric safety switch of new design and has a plant completely equipped. Officers are Herbert Beck, president; Martin P. Luther, vice-president; R. W. Hamilton, treasurer; Leslie M. Rice, secretary.

A. C. Woods & Co., Rockford, Ill., are in the market for a No. 5, William & White crank drop hammer.

The Kroehler Mfg. Co., 14 East Jackson Boulevard, Chicago, manufacturer of furniture, has awarded a general contract to the E. Taron Co., Kankakee, Ill., for a four-story addition to its factory at Naperville, Ill., 100 x 100 ft., to cost \$100,000 with equipment. Peter E. Kroehler is president.

Samuel Savitt, 12-14 South Jefferson Street, Chicago, manufacturer of metal specialties, has leased space in the building at 162 West Austin Avenue, for increased output, and will remove to this location.

The Jointless Fire Brick Co., 1135-50 Clay Street, Chicago, has preliminary plans for a two-story factory to cost \$150,000 with equipment. Lockwood, Greene & Co., 400 North Michigan Avenue, are architects and engineers. A. L. Schaefer is president.

The Pabst Chemical Co., 319 West Ohio Street, Chicago, has completed plans for a five-story factory at 1113-21 North Franklin Street, estimated to cost \$200,000 with equipment. Adolph Proskauer, 201 East Ontario Street, is architect.

The City Council, Le Sueur, Minn., is taking bids until June 5 for extensions and improvements in the municipal electric power plant. Ralph W. Richardson, Zenith Building, St. Paul, Minn., is consulting engineer.

The C. D. Edwards Mfg. Co., Albert Lea, Minn., manufacturer of road machinery, has tentative plans for a one-story addition, 75 x 200 ft., to cost \$55,000 with equipment. Gaarder & Gaarder, Home Investment Building, are architects.

The Northeastern Iowa Power Co., Clermont, Iowa, will build a new power plant at Greene, Iowa, to cost \$30,000. Ralph Thomas, 1200 Second Avenue South, Minneapolis, Minn., is engineer.

The Board of Education, Princeton, Ill., is planning rebuilding its commercial and industrial high school, recently destroyed by fire, to be three-stories, 70 x 220 ft., estimated to cost \$250,000. Royer, Danely & Smith, Flatiron Building, Urbana, Ill., are architects.

The Barrett Hardware Co., Joliet, Ill., has asked bids on a general contract for a three-story and basement storage and distributing plant for heavy equipment, 130 x 150 ft., to cost \$100,000. Charles W. Webster, Cutting Building, is architect.

St. Louis

ST. LOUIS, May 25.

BIDS will be received by the State Eleemosynary Board, Jefferson City, Mo., until June 1, for one electric generator, engine, heater, air compressor and accessory equipment for installation at the power house, State hospital No. 1, Fulton, Mo.; also for a 400-hp. boiler and stoker for hospital No. 4, Farmington, Mo. E. H. Harper, 3031 Park Avenue, Kansas City, Mo., is consulting engineer.

The Johnston County Power & Light Co., Reagan, Okla., is reported to be planning the construction of a hydroelectric power plant on Pennington Creek, near Ardmore, Okla., to cost \$250,000.

The Board of Education, Hot Springs, Ark., is considering the installation of manual training equipment in a proposed three-story junior high school, estimated to cost \$150,000, for which preliminary plans are being drawn.

The Phillips Petroleum Co., Bartlesville, Okla., will make extensions to its gasoline refinery at Wewoka, Okla., to

double the present capacity. Work is also under way on a new refining unit at Quay, Okla. The expansion is estimated to cost more than \$200,000.

The B. L. Hoffman Construction Co., 223 East Ninth Street, Kansas City, Mo., will erect a three-story automobile service, repair and garage building at 904-8 McGee Street, 95 x 115 ft., estimated to cost \$100,000 with equipment.

The Board of Administration, State House, Topeka, Kan., will ask bids about June 15 for a one-story and basement power plant at Larned, Kan., 55 x 108 ft., to cost \$60,000 with machinery. Charles D. Cuthbert, State House, Topeka, is architect.

The Harrisburg Light & Power Co., Harrisburg, Ark., has been acquired by new interests, headed by W. G. Tuell and associates. Plans are under advisement for extensions and the installation of additional equipment.

The Interurban Central Station Co., Scarritt Building, Kansas City, Mo., W. C. Scarritt, secretary, has tentative plans for a five-story automobile service, repair and garage building, 120 x 260 ft., to cost \$375,000 with equipment.

The City Council, Greensburg, Kan., has called a special election on June 8 to vote bonds for \$50,000 for extensions and betterments in the municipal electric light and power plant, including the installation of additional equipment.

The H. H. Machine & Motor Co., 4216 West Easton Avenue, St. Louis, has inquiries out for an air compressor and other equipment.

The Common Council, Bristow, Okla., plans the installation of deep-well pumping machinery in connection with extensions and improvements in the municipal waterworks, estimated to cost \$50,000.

Ohio

CINCINNATI, May 25.

CINCINNATI plants have increased operations slightly the past week and production is decidedly better than last month. Conditions are somewhat spotty, however, with some manufacturers reporting fairly good sales and others stating that business is quiet. The larger plants are operating at a fair rate. Several are working on foreign orders, principally for Europe. This business, much of which emanates from Germany, is confined mostly to special and automatic machines. Standard machines have been copied and produced so cheaply by European manufacturers that American makers are practically eliminated from competition abroad. Automobile manufacturers have placed some business locally in the past two weeks. There has been little railroad buying. The electrical and textile fields have yielded but few sales lately. Orders coming in at present are almost without exception for single machines.

Planer manufacturers are encouraged at the resumption of buying the past week. The Cincinnati Planer Co. booked an order for a 66-in. planer from a New Jersey concern and a 30-in. planer from the New York territory. Inquiries have increased and the outlook is favorable for good business. The Atchison, Topeka & Santa Fé is in the market for a 48-in. planer. Lathes are in better demand and milling machines are also more active. The Chesapeake & Ohio placed an order for several lathes with a local builder. The Delaware, Lackawanna & Western bought a shaper the past week. Manufacturers state sales have improved. Several makers of drilling machines report a falling off in business. Sales of conveying machinery have increased. Production is now about 75 per cent of the volume maintained a year ago.

In the Cleveland district machinery sales fell off considerably the past week. Business was confined mostly to single machines and no good inquiries came out. The automobile industry in Detroit is buying very little. Two brass working shops in Detroit each placed an order during the week for two lathes with a Cleveland manufacturer.

The Columbian Hardware Co., Cleveland, has awarded a contract to the J. L. Hunting Construction Co. for a two-story brick factory, 90 x 120 ft.

The H. D. Deutscher Co., Hamilton, Ohio, has awarded a contract for remodeling and adding to its foundry.

The Johnson Mfg. Co., Urbana, Ohio, has commenced the erection of two factory buildings, 100 x 125 ft. and 50 x 50 ft. It will manufacture tin ware, and will require some machinery and motors.

Harry C. Downey, 2103 Elmwood Avenue, Springfield, Ohio, is erecting a two-story factory, 120 x 150 ft., for the manufacture of electric signs.

The Hamilton Furnace Co., Hamilton, Ohio, is in the market for motors, conveying machinery and other equipment in connection with extensions to its blast furnace.

The Ideal Welding & Mfg. Co., Cincinnati, has been incorporated for \$25,000. It has been a partnership between F. A. Martin and E. C. Martin, but will start business as a corporation on July 1. Purchase of equipment is not contemplated at present.

The Columbia Aeroplane Co., Columbia, Tenn., recently incorporated to manufacture airplanes, is undertaking a commercial aviation project. No equipment has been purchased yet. F. F. Frakes is president.

The Wigner-Schurtz Co., Gallipolis, Ohio, operating an automobile sales and service station, is in the market for a cylinder reborning machine, small lathe and drill press.

The Arthur Chemical Co., 48 Miami Street, Columbus, Ohio, C. R. Monserrat, president, plans the construction of a power house and machine shop at its proposed salt and by-products plant at Athens, Ohio, to cost about \$200,000 with machinery. J. A. Martin, Hotel Berry, Athens, is engineer, in charge.

The Ohio Auto Spring Co., 50 South Lazell Street, Columbus, Ohio, is said to be planning the installation of additional equipment, including drill press, shearing machine, hydraulic press, etc.

The Board of Education, Kingsport, Tenn., plans the installation of manual training equipment in its proposed two-story high school estimated to cost \$175,000, for which bids have been asked on general contract. Mackenzie & Brady, 558 Main Street, are architects.

The City Council, New Philadelphia, Ohio, is considering plans for a municipal electric light and power plant, to cost \$50,000 with equipment.

The Common Council, Brownsville, Tenn., is said to be planning the installation of pumping machinery in connection with proposed extensions and improvements in the municipal waterworks. A bond issue will be arranged. F. G. Prout is engineer.

The City Council, Dover, Ohio, will proceed with the erection of an addition to the municipal electric light and power plant, for which a building contract has been let to Smith & Shafer, Dover.

The Peerless Auto Sales Co., 421 Cleveland Avenue, N. W., Canton, Ohio, local representative for the Peerless automobile, has plans for a two-story and basement service, repair and garage building, 100 x 150 ft., to cost \$160,000 with equipment.

The Colonial Insulator Co., Akron, Ohio, is considering the installation of a number of pebble mills suitable for grinding calcined material. James R. Hemphill is president.

The Chesapeake & Ohio Railroad has awarded a contract to Joseph E. Nelson & Son, Chicago, for a 14-stall roundhouse, a machine shop, power house, store house, engine supply house, water columns and engine washing platforms at Russell, Ky., to cost \$1,300,000.

Detroit

DETROIT, May 25.

PLANS have been completed by the Rich Steel Products Co., Battle Creek, Mich., manufacturer of structural steel specialties, for the erection of two one-story units, estimated to cost \$350,000 with equipment.

The Detroit Railway & Harbor Terminals Co., Buhl Building, Detroit, plans the construction of a one-story power house at its proposed eight-story freight terminal on West Jefferson Street, 180 x 625 ft. A cold storage and refrigerating plant will also be installed. Conveying, hoisting, loading and other freight-handling machinery will be purchased. The entire project will cost in excess of \$4,000,000. Albert Kahn, Inc., Marquette Building, is architect.

The Aetna Cement Co., Bay City, Mich., is said to have plans under consideration for the construction of a new mill unit, practically duplicating its present plant, estimated to cost \$1,000,000 with machinery.

The Detroit Show Case Co., 1652 Fort Street, Detroit, will erect a one-story and basement plant, 60 x 130 ft., to cost about \$50,000. B. C. Wetzel & Co., Dime Bank Building, are architects. Herbert Malott is secretary and treasurer.

The Consolidated Paper Co., Monroe, Mich., has plans under way for a new mill to cost approximately \$300,000, including machinery, for which superstructure work will soon begin.

The City Council, Bellaire, Mich., is planning the construction of a municipal water power plant, to cost \$75,000 with equipment. Ayers, Lewis, Norris & May, Cornwall Building, Ann Arbor, Mich., are engineers.

The D. J. Ryan Foundry Co., Ecorse, Mich., has awarded a general contract to the Truscon Steel Co., 615 Wayne Street, Detroit, for a one-story addition, to replace a structure recently destroyed by fire. D. J. Ryan is president.

The Motor Products Corporation, 11801 Mack Street, Detroit, is taking bids for two additions for considerable increase in capacity, to cost approximately \$85,000.

The Wilson Foundry & Machine Co., Pontiac, Mich., has awarded contract without competition to the Fryale Construction Co., Pontiac, for its three-story assembling plant, 100 x 400 ft., and one-story motor testing works, 60 x 200 ft., estimated to cost \$1,200,000 with equipment. Mills, Rhines, Bellman & Nordhoff, Ohio Building, Toledo, are architects. C. B. Wilson is president.

The Board of Education, Jackson, Mich., plans the installation of manual training equipment in its proposed new high school, estimated to cost \$1,200,000, in which amount bonds have been voted. It is expected to ask bids soon on a general contract. Childs & Smith, 64 East Van Buren Street, Chicago, are architects.

The Department of Street Railways, Detroit, plans the construction of an automobile service, repair and garage building for municipal buses to cost \$85,000.

The Nizer Corporation of Maryland has been incorporated with \$400,000 capital stock as successor to the Michigan corporation by that name at 7424 Mackie Street, Detroit. It has just completed an addition to its plant which it will occupy immediately. Equipment has been purchased. Glen P. Cowan is president.

The American Hume Concrete Pipe Co., United Savings Bank Building, Detroit, recently organized, is introducing the Hume centrifugal process of manufacturing reinforced concrete pipe. Sizes range from 4 in. to 8 ft. The company is the licensee of the Hume Pipe Co., Melbourne, Australia. It has a plant under construction which will be in operation within a few weeks. It will sell State and territorial rights to companies in the United States and Canada. Frank L. Klingensmith is president.

Gulf States

BIRMINGHAM, May 25.

THE Walworth Mfg. Co., 142 High Street, Boston, manufacturer of Stillson wrenches and kindred products, has completed arrangements for the purchase of the plant of the National Pipe & Foundry Co., Attalla, Ala., and has tentative plans for extensions and betterments, including the installation of additional equipment, reported to cost \$500,000. It will be operated as branch plant.

The City Council, Port Arthur, Tex., is taking bids until June 10 for two 50,000-gal. per min. capacity and one 20,000-gal. per min. pumping units, motor-driven for drainage service. J. P. Logan is mayor.

The State Board of Control, Austin, Tex., will install a machine shop and foundry at the State Orphans' Home, near Corsicana, Tex. Later an extension will be made in the new industrial buildings at the institution and a wood-working plant installed. A machine and mechanical department will also be established at the Juvenile Training School, Gatesville, for which an appropriation of \$75,000, is available.

The New Electric Ice Co., Fort Lauderdale, Fla., is completing plans for a new ice-manufacturing plant in the Croissant Park section, estimated to cost \$50,000 with equipment.

The E. L. Wilson Hardware Co., 339 Pearl Street, Beaumont, Tex., is having plans drawn for a one-story storage and distributing building at Houston, Tex., 150 x 150 ft., to cost \$60,000 with equipment. Sanguinet, Staats, Hedrick & Gottlieb, Second National Bank Building, Beaumont, are architects.

The Southwestern Gas & Electric Co., Shreveport, La., will proceed with superstructure work for a new local electric power plant, estimated to cost \$350,000, with machinery.

The Aetna Iron & Steel Co., Jacksonville, Fla., operating a steel fabricating works, has acquired property in the vicinity of Marshall and Hubbard Streets and plans the erection of an initial one-story unit, 90 x 200 ft., to cost about \$80,000. Machinery in the existing plant will be removed to the new works, and additional equipment installed. The present factory will be remodeled later for a warehouse. J. M. Burrell is president.

E. D. Priddy, Denton, Tex., has closed negotiations for the purchase of the local oil refinery of the Crescent Oil Refining Co., closed for more than three years. It has a rated output of 200 bbl. per day. The new owner will take immediate possession and plans improvements, including additional equipment and machinery replacements.

A company is being formed at Temple, Tex., to construct and operate an ice-manufacturing plant with initial capacity

of about 150 tons per day. It will cost \$125,000 with machinery. The Temple Chamber of Commerce is interested in the project.

The Common Council, Littlefield, Tex., plans the installation of pumping machinery in connection with a proposed municipal waterworks, estimated to cost \$75,000.

The Gasow-Howard Motor Co., Willow Street, Beaumont, Tex., has awarded a general contract to McDaniel & Hartford, 2355 Franklin Street, for a one-story machine and repair shop estimated to cost about \$18,000.

The Florida Public Service Co., Lake Wales, Fla., will proceed with the construction of a one-story ice-manufacturing plant, 72 x 80 ft., designed for an initial output of 40 tons per day. The machinery will be electrically-operated.

The Duval County Board of Public Instruction, Jacksonville, Fla., plans the installation of manual training equipment in its proposed two new senior high schools at Riverside and Springfield, and in the senior and junior high school to be erected at South Jacksonville, the three structures estimated to cost in excess of \$1,000,000. Mark & Sheftall, Clark Building, are architects for the first two noted schools and March & Saxeby, West Building, architects for the South Jacksonville structure. William B. Ittner, Board of Education, St. Louis, will act as supervising architect for all three schools, for which bids will be asked soon on a general contract.

F. Deane Duff, secretary of the Sugarland Drainage District, Clewiston, Fla., is asking bids until June 16 for a complete oil driven drainage pumping plant, with capacity of 180,000 gal. per min. The Elliott & Harman Engineering Co., Clewiston, and Memphis, Tenn., is engineer.

Charles E. Currie & Co., Ashland, Ala., machinery dealer, has inquiries out for an oil engine generating set, about 150 kva., a. c., three phase, 60 cycle, 2300 volts.

The Crown Central Petroleum Corporation, Houston, Tex., recently chartered under Delaware laws to take over existing oil properties and refineries, is disposing of a capital stock issue to total \$2,400,000, a portion of the proceeds to be used for extensions in refineries, storage and shipping facilities, including expansion of a refinery at Clarendon, La. W. A. Williams is president.

Indiana

INDIANAPOLIS, May 25.

WORK will soon begin on a new hydroelectric generating plant on the Elkhart River, near Bainterstown, Ind., by the Interstate Public Service Corporation, Indianapolis, with initial unit estimated to cost \$200,000. E. J. Albrecht, 25 South Dearborn Street, Chicago, is engineer.

W. Ellwood, Christman Building, South Bend, Ind., architect, has plans for a two-story and basement automobile service, repair and garage building, 60 x 165 ft., to cost \$70,000.

Fire, May 16, destroyed a portion of the plant of the Root Glass Co., Terre Haute, Ind., manufacturer of bottles and other hollowware, with loss estimated at \$100,000, including equipment. It is planned to rebuild.

The Holt & Brandon Ice & Cold Storage Co., 820 Walnut Street, Evansville, Ind., will build a new ice-manufacturing and cold storage plant estimated to cost \$200,000 with equipment. The machinery will be electrically-operated. The George B. Bright Co., 2615 Twelfth Street, Detroit, is architect and engineer.

The Pittsburgh Screw & Bolt Co., Preble Avenue, Pittsburgh, operating the Gary Screw & Bolt Co., Gary, Ind., has acquired the plant and business of the Continental Bolt & Iron Co., 2225 West Forty-third Street, Chicago, and will take over the property on June 1. The Chicago plant will be consolidated with the Gary works which will be expanded to accommodate the increase. William G. Costin is chairman of the board of the Pittsburgh company.

The City Council, Huntington, Ind., will erect a one-story addition to its steam power plant and install additional equipment. Improvements will also be made in the present station. Contract for the building has been let to J. W. and W. C. Martin, Board of Trade Building, Indianapolis.

The Liberty Township Board of Education, North Liberty, Ind., is considering the installation of manual training equipment in its proposed two-story high school, for which superstructure will soon begin, estimated to cost \$110,000. Freyermuth & Maurer, Associates Building, South Bend, Ind., are architects.

The Calumet Gas & Electric Co., Gary, Ind., will take over and consolidate several light and power plants and contemplates extensions and improvements with the installation of additional equipment.

Pacific Coast

SAN FRANCISCO, May 20.

PLANS have been filed by the Payne Furnace & Supply Co., 162 North Los Angeles Street, Los Angeles, for a one-story factory at Beverly Hills, near Los Angeles, 150 x 180 ft., to cost \$25,000.

The Southern California Edison Co., Los Angeles, will issue preferred stock to total \$11,500,000, the proceeds to be used for extensions and improvements in its power plants and system. In its application for authority to the state commission, the company sets forth that it will expend a gross of \$25,000,000 during the present year, of which \$11,500,000 will be used for hydroelectric power plant and other station construction, and the remainder for steel tower transmission lines and other system work.

The Gray Auto Equipment Co., Woodland, Cal., has acquired property at Westgate, a recently established county townsite, and will erect a new plant to cost about \$75,000 with equipment.

The Crane Co., 836 South Michigan Avenue, Chicago, has acquired property on India Street, San Diego, Cal., and contemplates the erection of a new factory branch and distributing plant, to cost about \$80,000. Local offices of the company are at 345 Fourth Street.

A. E. Cranston, 1311 Post Street, Spokane, Wash., has filed plans for a one-story machine shop at 2940 Stone Street, estimated to cost \$10,000 with equipment.

A new company is being organized at Raymond, Wash., headed by Homer Edwards, 3637 South Tacoma Avenue, Tacoma, Wash., to construct and operate a plant for the manufacture of doors, panels and other millwork products, to cost \$60,000 with equipment. The Raymond Commercial Club is interested in the project.

The Western Auto Supply Co., 517 East Seventh Street, Los Angeles, will proceed with the erection of a five-story service, repair and garage building, estimated to cost about \$65,000.

The City Council, South Gate, Cal., is considering the installation of electric-operated pumping machinery in connection with the proposed purchase of the local waterworks from private interests, and extensions and improvements, estimated to cost \$150,000.

Frye & Co., Ninth Street South and Walker Avenue, Seattle, will erect a cold storage and refrigerating plant at Sapperton, B. C., fronting on the line of the Great Northern Railway, estimated to cost \$350,000 with machinery.

The Wasco High School District, Wasco, Cal., has plans for a new manual training shop at the local high school to cost approximately \$50,000.

The Union Ice Co., 354 Pine Street, San Francisco, will build a one-story ice-manufacturing plant, 60 x 106 ft., at Sawtelle, near Los Angeles. John M. Cooper, Marsh-Strong Building, Los Angeles, is architect.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, has awarded a general contract to Thebo-Starr & Anderton, Sharon Building, for its proposed mechanical works at Emeryville, Cal., comprising foundry, machine shop, laboratory and general storage building, estimated to cost \$200,000 with machinery. The company engineering department is in charge.

The International Radio Corporation, care of Francis D. Adams, California Building, Los Angeles, Cal., recently organized with \$200,000 capital stock, will manufacture as indicated. It is in the market for equipment and materials. No contracts have been awarded yet.

Milwaukee

MILWAUKEE, May 25.

HOPES of improved business in machine tools are being pinned to prospects for a relatively liberal placement by various railroads, although this has reached the point merely of informal inquiries. The Chicago, Milwaukee & St. Paul has considerable replacement work to do in its West Milwaukee locomotive and car repair shops. This work has been delayed several years by financial limitations, but is becoming imperative. Local foundries and machine shops are furnishing some new business, but sales of more than two or three units to an individual buyer are rare. Employment in local metal trade shops gained 2.6 per cent the past month, with the number 83.8 per cent of the peak in March, 1920, which is used as the basis of comparisons.

The Whitehouse Cooker Co., Fond du Lac, Wis., has been incorporated with \$50,000 capital stock by local stockholders in the defunct Henry A. Poppert & Son Co., who bid in the assets at trustee's sale and will resume the operation at once. The Poppert plant, formerly at Milwaukee, consists of a brass and aluminum foundry, die casting plant, pattern shop, machine shop, etc., and was used largely for manufacturing steam pressure cookers. A. E. Treleven is temporarily in charge for the new owners.

The Tobin Tool & Die Co., Fond du Lac, Wis., will move June 1 from the second floor of the Demountable Typewriter Co. building into new quarters in the former plant of the Drophead Projector Corporation at Brooke and Ruggles Streets. This will more than double the capacity, which is needed to handle a new standing order for tools and dies from the Stewart-Warner Corporation, Chicago, which is engaging in the manufacture of radio receivers. Some additional equipment is being purchased.

The Wehr Co., 533-545 Thirtieth Street, Milwaukee, manufacturer of graders and other tractor attachments and specialties, has leased 50,000 sq. ft. in the former gas engine plant of the Avery Co., Peoria, in West Allis, and will re-equip it for production of a one-man power grader used with Fordson tractors. The Wehr Co. is owned by the officers of the Wehr Steel Co., manufacturer of electric steel castings, at Forty-fifth and Gordon Avenues. The new grader works are at Fifty-seventh Avenue and Mitchell Street. Henry W. Wehr is president and general manager.

Joseph M. Dierienzo and M. M. DeWitt of Madison, Wis., are organizing a corporation to undertake the manufacture of a new type of steel rim for automobile wheels with a quick demountable feature on which they have obtained letters patent. An initial investment of about \$35,000 in plant and machinery is contemplated.

Contracts are being let this week by E. J. & J. R. Law, architects, Madison, Wis., for a two-story addition, 50 x 96 x 177 ft., for the French Battery & Carbon Co., 2317 Winnebago Street, Madison. Considerable new equipment for making dry batteries, flashlights and similar specialties is being purchased. The present improvement, the first of a series of additions, will cost about \$150,000.

The Clarence Burkert Co., 1653 Grange Avenue, Racine, Wis., has awarded contracts for the erection of a public garage, sales and service building, estimated to cost \$38,000, and is buying shop tools, equipment, fixtures, etc.

The Badger Mfg. Corporation, 156 Clinton Street, Milwaukee, manufacturer of automobile bumpers, is buying a considerable list of equipment for its new plant, to be occupied after June 15. It has leased 75,000 sq. ft. in the former Avery Co. foundry and machine shop at Fifty-seventh Avenue and Mitchell Street, in West Allis, providing fully twice the present capacity. Charles H. Hathaway is president and general manager.

The A. O. Smith Corporation, Keefe Street, Milwaukee, manufacturer of pressed steel automobile frames, has started active production of a new type of steel casing couplings for connecting joints in oil pipe lines. Considerable new equipment has been bought and some remains to be purchased for this department and another new department which soon will begin the manufacture of cracking stills for converting crude oil into gasoline and by-products. The stills are built up and welded by a new process perfected at the Smith works.

Canada

TORONTO, May 25.

THE demand for machine tools continues in units of one or two to a buyer. The general trend of buying is toward quantity production tools of new design. The automotive industry and the railroad shops are the most active buyers at present, but dealers and builders are also receiving a good demand for various lines of equipment. The pulp and paper industry is providing a large volume of business for engineering firms, and will within the next few months begin installing machinery in mills which are now under construction or about to start. There is also a good movement in equipment for electrical development plants, as well as for motor-driven equipment for other industries.

The Backus-Brooks Co. will build additions and install new equipment in its mills at Kenora and Fort Francis, Ont. A paper machine to have a capacity of 1100 ft. per min. and produce a sheet of newsprint 245 in. wide will be installed at Kenora. The machine has been ordered and will be in operation in about seven months.

The Anglo-Canadian Paper Co., Montreal, will start work soon on the erection of a 400-ton paper mill near Quebec.

The International Paper Co., Three Rivers, Que., has awarded contracts for addition to its mills. It also proposes to erect a new mill on the Gatineau River where it recently secured a location. Extensive power development is planned in New Brunswick and Quebec.

The Sterling Products Co., head office Montreal, has taken out a permit for the erection of a factory on Elliott Street, Windsor, Ont., to cost \$100,000.

The machine shop of the Ottawa Electric Railway, 198 Mill Street, Ottawa, Ont., was recently damaged by fire with a loss of \$5,000.

The Town Council, Mactier, Ont., is arranging for the installation of a waterworks plant and system, and has engaged James, Proctor & Redfern, consulting engineers, Toronto, to prepare plans and specifications for a pumping plant and distribution system.

Western Canada

Frye & Co., Sapperton, B. C., are having plans prepared for the erection of a cold storage plant to cost \$400,000. Bids will be called about June 20.

Bloedel, Stewart & Welch, Vancouver, B. C., will start work in the near future on the erection of a large sawmill on a 90-acre site recently purchased on the Fraser River near New Westminster, B. C.

The United States district court at Dayton, Ohio, as the result of a directed verdict, has entered a judgment declaring the Triumph Electric Co., Cincinnati, not a bankrupt, and has dismissed the petitions of three creditors. The company produced evidence to show that its assets exceeded its liabilities by \$500,000.

Industrial Items

The Keystone Heating & Equipment Co., 1317 South Juniper Street, Philadelphia, recently incorporated, will continue a business established in 1915 as plumbing, heating and power piping contractors. George J. Robinson is secretary-treasurer.

The Electrovacuum Refrigerator Corporation, 135 West Forty-second Street, New York, has been incorporated with \$100,000 capital stock to act as distributor of refrigerators and equipment which will be manufactured elsewhere.

The Williamsport Die & Machine Co., 917 Nichols Place, Williamsport, Pa., incorporated with \$25,000 capital stock, will take over an established business in the manufacture of cutting dies for leather, rubber, etc. Aside from this the company manufactures small special machines and machine parts. F. P. Fawcett and E. G. Knights are the principals.

The Republic Flow Meters Co., Chicago, has opened an office at 617 Engineers Building, Cleveland, in charge of L. C. Wilson, formerly of the Pittsburgh office.

The Boyer-Pickens Battery Co., Fifth and Walnut Streets, Terre Haute, Ind., has been incorporated as jobber for battery service station supplies and equipment. The company also will manufacture batteries. C. Fred Boyer is manager.

The Buckley & Scott Co., 159 Broad Street, Providence, R. I., recently incorporated, is a distributing branch of the American NoKol Co., maker of automatic oil heating equipment. A. Buckley, Jr., is manager of the Providence office.

The Electric Service Station, 53 Commerce Avenue, Grand Rapids, Mich., incorporated with \$20,000 capital stock, will act as distributor of automobile accessories. It will also maintain a service station.

The Shelley Equipment Co., Lincoln, Neb., recently incorporated, is a distributor of farm equipment and supplies. H. E. Shelley is secretary-treasurer.

The Continental Electric Co., 1705 Baltimore Avenue, Kansas City, Mo., has been organized with capital of \$35,000 to conduct a wholesale electrical supply business. It will act as a distributor for several large manufacturers. T. A. Waldo is president.

The Nebraska Auto & Truck Mfg. Co., Thirtieth and Sprague Streets, Omaha, Neb., has taken over the plant formerly operated as the Douglas Motors Co., and will continue to manufacture and sell trucks. L. C. Nash is president.

The Combustion Engineering & Equipment Co., 633 North Howard Street, Baltimore, has been organized as consulting and contracting fuel engineer specializing in the junior sizes of anthracite coal.

The C. T. Small Mfg. Co., Ferguson and Vernon Avenues, St. Louis, has been incorporated to manufacture pneumatic milling machinery, continuing a company established about 20 years. H. S. Townsend is secretary.

Foreign

THE South African Railways and Harbors Board, Johannesburg, S. A., is asking bids until July 6 for a quantity of boiler tubes of charcoal iron, steel, and brass, and steel superheater flue tubes, as per specifications.

The Honolulu Iron Works, Honolulu, T. H., and 833 Broadway, New York, have contracted with Ynchausti & Co., Manila, P. I., for the erection of a new sugar mill in the Philippines, with initial capacity of 5000 tons per day. The works will include a power house and machine shop.

The South Indian Railway Co., Ltd., 91 Petty France, London, England, is asking bids until June 19 for 110 meter-gage bogie steel high-sided wagons for use on its lines.

The Foreign Trade Bureau, Philadelphia, has received the following inquiries: (43563) from the United Business Corporation, E. Cuneo, Lima, Peru, desiring quotations c. l. f. Callao, on wire, zinc plates, tin solder, wire spikes, sanitary articles, etc.; (43579) from Guillermo Huper, Avenida Central, P. O. Box No. 9, Matagalpa, Nicaragua, desiring to get in touch with American manufacturers of shovels and spades, horseshoe nails, horse and mule shoes, etc.; (43574) from Compania Bancaria de Paris y Mexico, S. A., P. O. Box No. 170, Torreon, Mexico, desiring to purchase for its customers (cotton growers) a number of improved platform scales, asking catalogs, export prices and discounts, scales to have a capacity of 500 kilograms (base to be figured in kilograms, not lb.) of a size 1 meter by 80 centimeters; (43571) from Natalio Ulibarri y Compania, Av. de la Independencia, 39, Vera Cruz, Mex., in the market for a number of automatic coin-slot scales, and (43567) from Toko Mascotte, Sourabaya, Java, Dutch East Indies, wishing to get in touch with American manufacturers of machine tools, bolt and nut manufacturing machinery, mechanical rubber goods, etc.

The Hoopes & Townsend Co., 1330 Buttonwood Street, Philadelphia, recently was incorporated as a combination of the Hoopes & Townsend Co. and the Hoopes & Townsend Steel Co., which are now under one corporate management. Justin Burns is president.

The National Machinery Co., care of William S. Nye, 20 Barnes Street, Providence, R. I., has been incorporated as a buying and selling exchange for used textile machinery.

The Smith Springfield Body Corporation, Springfield, Mass., maker of automobile bodies, has reorganized with James N. Swift as president to succeed C. S. Dame. Ralph M. Sparks is vice-president in charge of sales, succeeding A. H. Wolfe; and Frank M. Livingstone, formerly secretary, becomes treasurer, succeeding C. S. Dame. L. L. Homer is the new secretary. Hinsdale Smith is vice-president in charge of engineering, a newly created office.

On May 9 the Coplan Steel Co., Ogdensburg, N. Y., made its first shipment of steel. An appraisal of \$450,000 has been made on the company's properties, preparatory to issuing first mortgage bonds.

Shipments of the Eaton Axle & Spring Co. in April reached \$708,048, the highest for any month this year.

The Max L. Israel Co., Dayton, Ohio, has changed its name to the Builders' Structural Steel Co. It has been divided into two departments, the steel division to be under the new name and the scrap iron department to be continued as the Max L. Israel Co.

The Maxwell Motor Corporation, Detroit, will move its automobile body factory from Dayton, Ohio, to Detroit on June 1. A dry kiln will remain in operation at Dayton for commercial purposes.

Large Order for Derricks

Receipt of an order for 110 steel derricks to be used in the mid-continent oil fields, is announced by the Emseco Steel Products Co., Los Angeles, Cal. Production of the initial derricks, which were ordered by the Midwest Refining Co. of Salt Creek, Wyo., is under way at the Emseco plant, according to W. A. Trout, vice-president and general manager of the Los Angeles concern.

The production capacity of the plant has been doubled in the past 30 days by the installation of three punching machines and a three-ton Shepard electric crane, furnished by the Union Iron Works. In the past two months, the Emseco Steel Products Co. has manufactured 54 California heavy-duty 122-ft. steel derricks for the oil fields of the Los Angeles basin, in addition to beginning production of the derricks for the Midwest Refining Co.

All Los Angeles speed records for delivery and installation of three-ton electric cranes were broken by the Union Iron Works in order to accommodate the Emseco firm and facilitate the equipment of its plant to handle the large derrick order. The equipment was installed and in operation within 14 days from the date it was ordered.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general headings of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Bars:		
Refined iron bars, base price	3.24c.	
Swedish charcoal iron bars, base	7.09c. to 7.25c.	
Soft steel bars, base price	3.24c.	
Hoops, base price	4.49c.	
Bands, base price	3.99c.	
Beams and channels, angles and tees, 3 in. x 1/4 in. and larger, base	3.34c.	
Channels, angles and tees under 3 in. x 1/4 in. base	3.24c.	
Steel plates, 1/4 in. and heavier	3.34c.	

Merchant Steel		Per Lb.
Tire, 1 1/2 x 1/2 in. and larger	3.30c.	
(Smooth finish, 1 to 2 1/2 x 1/4 in. and larger)	3.65c.	
Toe-calk, 1/2 x 1/2 in. and larger	4.20c.	
Cold-rolled strip, soft and quarter hard	7.00c.	
Open-hearth spring steel	4.50c. to 7.00c.	
Shafting and Screw Stock:		
Rounds and hex.	4.15c.	
Squares and flats	4.65c.	
Standard tool steel, base price	15.00c.	
Extra tool steel	18.00c.	
Special tool steel	23.00c.	
High-speed steel, 18 per cent tungsten	70c.	

Sheets		Per Lb.
Blue Annealed		
No. 10	3.89c.	
No. 12	3.94c.	
No. 14	3.99c.	
No. 16	4.09c.	

Box Annealed—Black		Per Lb.
Soft Steel	C. R. One Pass	Blued Stove Pipe Sheet
Per Lb.	Per Lb.	Per Lb.
Nos. 18 to 20	4.15c. to 4.40c.	4.95c.
Nos. 22 and 24	4.20c. to 4.45c.	4.95c.
No. 26	4.25c. to 4.50c.	5.00c.
No. 28*	4.35c. to 4.60c.	5.10c.
No. 30	4.55c. to 4.80c.	.....
Galvanized		Per Lb.
No. 14	4.45c. to 4.70c.	
No. 16	4.60c. to 4.85c.	
Nos. 18 and 20	4.75c. to 5.00c.	
Nos. 22 and 24	4.90c. to 5.15c.	
No. 26	5.05c. to 5.30c.	
No. 28*	5.35c. to 5.60c.	
No. 30	5.85c. to 6.10c.	

*No. 28 lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe		Per Lb.
Standard Weld	Black	Galv.
1/2 in. Butt	46	29
5/8 in. Butt	51	37
1-3 in. Butt	53	39
2 1/2-6 in. Lap	48	35
7 & 8 in. Lap	44	17
11 & 12 in. Lap	37	12

Bolts and Screws

Machine bolts, cut thread, 40 and 10 per cent off list
Carriage bolts, cut thread, 30 and 10 per cent off list

Coach screws, 40 and 10 per cent off list

Wood screws, flat head iron,

7 1/2, 25, 10 and 5 per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER Per Lb.

Bright, basic	4.25c.
Annealed, soft	4.50c.
Galvanized, annealed	5.15c.
Coppered, basic	5.15c.
Tinned, soft Bessemer	6.15c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire	
BASE PRICE	
High brass sheet	18 1/2c. to 19 1/2c.
High brass wire	18 1/2c. to 19 1/2c.
Brass rods	15 1/2c. to 16 1/2c.
Brass tube, brazed	26 1/2c. to 27 1/2c.
Brass tube, seamless	22 1/2c. to 23 1/2c.
Copper tube, seamless	23 1/2c. to 24 1/2c.

Copper Sheets	
Sheet copper, hot rolled, 20 1/2c. to 21 1/2c. per lb. base.	

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates	
Bright Tin	Coke—14 x 20
Grade "AAA"	Grade "A"
Charcoal 14x20	Charcoal 14x20
IC.. \$11.25	\$8.85
IX.. 12.85	10.85
IXX.. 14.40	12.55
IXXX.. 15.75	13.85
IXXXX.. 17.00	15.05
Prime 80 lb...	\$6.15
90 lb...	6.30
100 lb...	6.45
IC..	6.65
IX..	7.85
IXX..	9.00
IXXX..	10.35
IXXXX..	11.35
Seconds	5.90
6.05	
6.20	
6.40	
7.60	
8.75	
10.10	
11.10	

Terne Plates	
8 lb. coating, 14 x 20	
100 lb.	\$7.00 to \$8.00
IC..	7.25 to 8.25
IX..	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin	
Straits, pig	.59c.
Bar	.61c. to .65c.

Copper	
Lake ingot	16 1/2c.
Electrolytic	16 1/2c.
Casting	16 c.

Spelter and Sheet Zinc	
Western spelter	.9c.
Sheet zinc, No. 9 base, casks	12c. open 12 1/2c.

Lead and Solder*	
American pig lead	9 1/2c. to 10c.
Bar lead	12c.
Solder, 1/2 and 1/2 guaranteed	39 1/2c.
No. 1 solder	36 1/2c.
Refined solder	30c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.	.75c. to .90c.
Commercial grade, per lb.	.35c. to .50c.
Grade D, per lb.	.25c. to .35c.

Antimony

Asiatic 18c. to 19c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	.36c.

Old Metals

The market continues unsettled in sympathy with new metals. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.50
Copper, heavy wire	11.00
Copper, light bottoms	9.25
Brass, heavy	6.75
Brass, light	5.50
Heavy machine composition	8.50
No. 1 yellow brass turnings	8.00
No. 1 red brass or composition turnings	8.00
Lead, heavy	7.25
Lead, tea	5.50
Zinc	4.00
Cast aluminum	17.00
Sheet aluminum	17.00